APPROACHING THE COMMUNITY GARDEN: HOW PHYSICAL FEATURES AFFECT IMPRESSION

by Melissa Lorraine Surratt

APPROACHING THE COMMUNITY GARDEN:
HOW PHYSICAL FEATURES AFFECT IMPRESSION

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ABSTRACT

Despite the evidence documenting the beneficial effects of community gardens on health and community development, there exist many threats to public support. This study is an investigation of how various community garden features are associated with impression. A secondary aim of the study was to examine how prior experience with gardening might influence the relationship between community garden aesthetics and impression. In an online photo survey, respondents rated community garden scenes based on three components of impression: preference, safety, and public value.

Results indicate that among several physical features evaluated, trees and other natural features, as well as maintenance style, have the most significant effects on impression. A moderate level of trees and other natural features was found to elicit the most positive safety ratings, however; a very high level of this feature received the highest public value ratings. Formal gardens received higher ratings than informal gardens for all three components of impression. Expertise was also found to moderate the relationship between these physical features and impression. The difference among experts was especially prounounced for community gardeners compared to both laypeople and urban planners.

BIOGRAPHICAL SKETCH

Melissa Surratt received a Bachelors in Environmental Design from the University of Colorado in 2003. While architectural design by itself was a definite passion of hers, she realized that she was more interested in design that can improve the lives of disadvantaged populations. In order to gain experience in this realm, she applied for a position as a case manager at a transitional housing program. She was hired and for two years worked with homeless families on various goals such as finding and maintaining employment, budgeting, obtaining benefits, and acquiring permanent housing. In 2006 she was admitted to the Cornell University Masters in Design and Environmental Analysis (Human-Environment Relations) program, where she focused on issues of environmental design that influences health and wellbeing. Specifically, Melissa researched urban community gardens, a setting which hosts three of her main interests; environmental design, community development, and social justice.

In October 2008, Melissa returned to Colorado and joined the Children, Youth & Environments Center for Research and Design as a Research Assistant. She hopes to continue exploring the world of urban greenspace, especially in the context of children's environments. Melissa is a Colorado native, and is excited to be back working in the communities where she grew up.

To Mom and Dad.

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TABLE OF CONTENTS

Biographical Sketch……..iii

Dedication.....iv

Acknowledgements…….....v

List of Figures…….....vii

List of Tables…….....viii

Chapter 1: Introduction and Literature Review…….....1

Chapter 2: Methods…….....23

Chapter 3: Results…….....43

Chapter 4: Discussion…….....78

LIST OF FIGURES

1.1 “Two Urban Landscapes”.....4
1.2 “Tower of Toys”.....9
1.3 Example of French Formal Garden.....12
1.4 Example of English “Informal” Garden.....13
1.5 Examples of Casitas.....19
1.6 Examples of Casitas.....19

1.7 Example of a Gazebo.....19

2.1 “Flow Chart” of Physical Feature Quantification Process……..…26
2.2 Physical Feature Variable Rating Survey for Judges……29
2.3 Example of Photo Survey Page…….....33
2.4 Example of a Community Garden Scene.....35
2.5 Example of a More Formal Community Garden Scene.....36

3.1 Photos Receiving the Lowest Impression Ratings……..…..43
3.2 Photos Receiving the Lowest Impression Ratings……..……...43
3.3 Photos Receiving the Highest Impression Ratings……..….....43
3.4 Photos Receiving the Highest Impression Ratings……..…..….....43
3.5 Mean Sense of Safety Ratings for Trees.....46
3.6 Mean Preference and Public Value Ratings for Community Identity.....47
3.7 Mean Impression Ratings for Maintenance Style.....48
3.8 Mean Sense of Safety Ratings for Openness of View.....49
3.9 Mean Sense of Safety and Public Value Ratings for Tree-Nature.....51
3.10 Mean Sense of Safety Ratings for Built-Identity.....52
3.11 Mean Preference Ratings for Built-Social.....53
3.12 Mean Preference and Public Value Ratings for Cultural.....54
3.13 Example of Formal, Built, Open Garden Setting Type.....55
3.14 Example of Informal, Dense Natural Garden Setting Type.....56
3.15 Example of Informal, Natural, Cultural Garden Setting Type.....57
3.16 Example of Informal, Built, Cultural Garden Setting Type.....57
3.17 Mean Impression Ratings for Garden Setting Types.....59
3.18 Mean Impression Rating Differences Among Expert Groups.....62
3.19 Mean Ratings for Preference and Public Value for Gender.....64
3.20 Box Plot Showing Mean Safety Ratings for Income.....65
3.21 Mean Preference Ratings for Tree-Nature.....68
3.22 Mean Public Value Ratings for Tree-Nature.....69
3.23 Mean Preference Ratings for Different Types of Style.....71
3.24 Mean Sense of Safety Ratings for Different Types of Style.....71
3.25 Mean Public Value Ratings for Different Types of Style.....72

LIST OF TABLES

2.1 Physical Feature Measurements……....25
2.2 Physical Feature Variables Rated by Judges……27
2.3 Correlations of 8 Individual Physical Features……..30
2.4 Preference Safety and Public Value Correlations……....33
2.5 Participant Group Samples……..39
2.6 Target Groups: Age and Gender……40
2.7 Target Groups: Ethnicity and Race……40
2.8 Target Groups: Level of Education……..…..40
2.9 Target Groups: Income……....41

3.1 Results from HLM Using Physical Features to Predict Impression.....44
3.2 Results from HLM Using Combined Physical Features.....50
3.3 Mean Dependent Variable Scores for Garden Setting Types.....58
3.4 Expert's Mean Ratings of Community Gardens.....60
3.5 Results from HLM Using Demographic Information.....63
3.6 Results from Regression Analysis Using Expertise and Tree-Nature.....67
3.7 Results from Regression Analysis Using Expertise and Style.....70

CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

Since the early 1970s, in tandem with the community development movement, beautification efforts by community gardeners have transformed derelict abandoned lots into nature oases. Despite the evidence documenting the beneficial effects on health and community development of community gardens, general public support remains in a developmental stage. This study examines the link between the appearance of community gardens and public support.

Chapter 1 presents an overview of the current state of urban community gardens in the United States. First the benefits of community gardens are explored. Then reasons for lack of public support are described. Lastly, I examine why public support is critical.

Benefits of Community Gardens

Greenspace is credited with a multitude of benefits, especially in the context of the city. The natural environment provides conducive settings for engaging in restorative activities (Kaplan, 1995; Pretty, 2004; Ulrich, 1984).

Image Citations:

1) (See page 4): Figure 1.1. Hough, M. (2004). *Cities and natural process*. London and New York: Routledge.
2) (See page 9): Figure 1.2. Photographer: Will Femia. Saltz, J. (2008, May 25). Tower of rabble: An elegy for the city's folk-art monumentalism. *New York Magazine.* Retrieved June 16, 2009, from http://nymag.com/news/intelligencer/47237/
3) (See page 12): Figure 1.3. Photographer Wolf Meusel (Public Domain, http://en.wikipedia.org/wiki/File:04-06-12_Valloires-_Abbaye_de_01.JPG).
4) (See page 13): Figure 1.4. Photographer: James Long (Creative Commons Attribution, http://en.wikipedia.org/wiki/File:Claremont_Belvedere.jpg).
5) (See page 19) : Figures 1.5, 1.6, and 1.7. Photographer Melissa Surratt.

Greenspace provides opportunities for preservation of natural resource diversity which in today's urban ecosystems are increasingly rare, but integral to the sustainable vitality of today's urban ecosystems (Hough, 2004; Nassauer, 1995). Greenspace has even been found to increase neighborhood property values (Been & Voicu, 2006; Wilkie & Roach, 2004)[1].

Community gardens provide a vast array of tangible, therapeutic, economic, and environmental benefits to gardeners as well as to the surrounding community. These gardens are a source of affordable fruits and vegetables, essential commodities against the rising tide of food insecurity and obesity (Sallis & Glanz, 2006; Twiss, Dickinson, Duma, Kleinman, Paulsen, & Rilveria, 2003). Additionally, the settings provide socio-cultural benefits (Kuo, Sullivan, Coley, & Brunson, 1998; Krasny, Tidball, & Broussard, 2008; Patel, 1991; Shinew, Glover, & Parry, 2004), such as opportunities for interaction between community members of all ages, ethnicities (Saldivar-Tanaka & Krasny, 2004), backgrounds, and levels of gardening experience (Enterprise Foundation, 2002).

Growing interest in urban greenspace

Top-down shift in sentiment towards community gardens

In New York City in 1994, with leadership from the newly elected Mayor Rudolf Giuliani, community gardens were transferred from the Department of Parks and Recreation to the Department of Housing Preservation and

[1] While studies (Been & Voicu, 2007; Wilkie & Roach, 2004, p.1) have shown that community gardens increase neighboring property values, an unfortunate (unfortunate for some, fortunate for others) side-effect is gentrification; thus making it difficult for the community who started the garden to afford to live there.

Development (HPD) (Schmelzkopf, 2002). In the face of enraged garden advocates, HPD deemed the gardens to be "vacant" land and in 1996, fifty gardens were slated for development (Schmelzkopf, 2002). However; thanks to partnerships among neighborhood advocate groups, city agencies, and nonprofits such as the New York Restoration Project (NYRP), the Trust for Public Land, and GreenThumb, many gardens were bought and saved from the bulldozers throughout the 1990s (New York City Department of Parks and Recreation [NYCDPR], 2010). Then-Attorney General Eliot Spitzer worked to preserve more than 400 gardens, transferring many of them to the Parks Department (NYCDPR, 2010).

Only a few years later, with the election of Mayor Michael Bloomberg in 2001, the change in direction of community garden sentiment began to take hold. In February 2009, U.S. Agriculture Secretary Vilsack announced the People's Garden initiative. At the time of this thesis, over 400 new community gardens exist in all 50 states (United States Department of Agriculture [USDA}, 2010).

Ecological sustainability

Urban greening, or efforts to create and preserve greenspace in cities, is an increasingly popular theme in public policy, land management, and city planning (Wolf, 2008). This socio-ecological movement has come about largely because of a growing awareness of the importance of ecological sustainability in cities, (Hough, 2004; Parsons, 1995; Wolf, 2008) which is where the majority of the people in the world reside (Science Daily, 2007).

Several new academic fields and areas of empirical research are being born out of the sustainability movement. One such area of study is the

emerging field of “civic ecology” (Krasny, Tidball & Broussard, 2008; Tidball & Krasny, 2007), which “refers to a variety of environmentally-related initiatives and actions that are organized and controlled locally, and that result in enhanced natural and social capital” (Krasny, Tidball & Broussard, 2008, p. 2). Public dissemination efforts in areas such as civic ecology are still nascent, and as Hough (2004) exemplifies with these photographs (Figure 1.1), the type of urban landscape that support ecological biodiversity and ecosystem function are still often seen as less attractive than those managed for purely aesthetic purposes (Gobster, Nassauer, 1995; Nassauer, Daniel, & Fry, 2007; Hough, 2004).

> If we make the not unreasonable assumption that diversity is ecologically and socially necessary to the health and quality of urban life, then we must question the values that have determined the image of nature in cities. A comparison between the plants and animals present in a regenerating vacant lot, and those present in a landscaped residential front yard, or city park, reveals that the vacant lot generally has far greater floral and faunal diversity than the lawn or city park. Yet all efforts are directed towards nurturing the latter and suppressing the former (Hough, 2004, pp. 7-8).

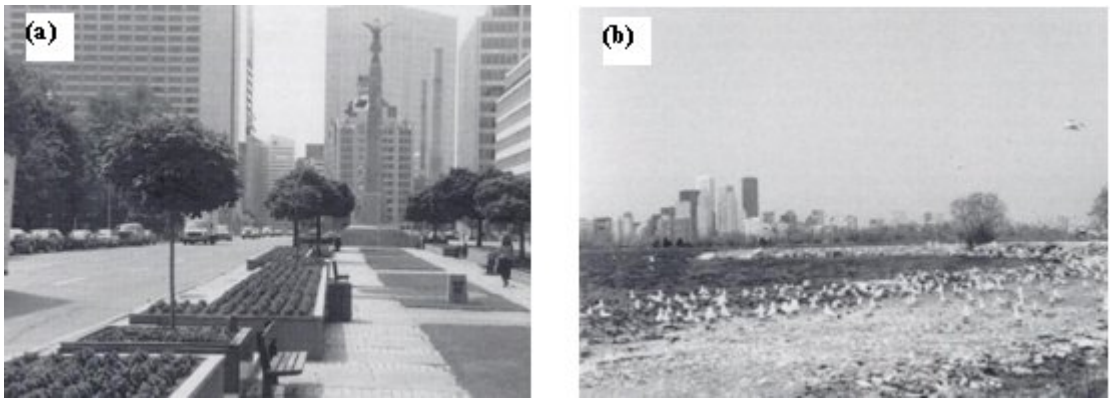

Figure 1.1. “Two Urban Landscapes. A formally landscaped boulevard, and an abandoned waterfront site. Which is the derelict site? (a) Has four or five species of plants and supports no wildlife. (b) Supports over 400 species of plants and is visited by 290 species of birds” (Hough, 2004, p. 7).

As the need for sustainably designed communities becomes increasingly popular, so too does the need to reevaluate the paradigm of beauty in the urban landscape.

ACGA Research Agenda

According to the research agenda developed by the American Community Gardening Association (1992), research examining “important community greening issues” is needed, including issues of garden design. Specifically, the list of research priorities includes: “Preference for ’built‘ versus ‘natural’ elements”; “the effect of aesthetics on landscape perception”; “visual assessment of urban greening projects”; and “the “role of the design professional” (American Community Gardening Association [ACGA], 1992, pp. 1-5).

While past studies have examined some of the abovementioned aspects of impression in the context of other types of urban greenspace, there remains a significant deficit for community gardens. The current study takes a step towards addressing this, and provides groundwork for future research, and planning and design. When design is informed by environmental psychology research, the probability increases that the resulting design will meet the needs and desires of the public (Kuo, 2002).

Challenges to Public Support

> “He shook his head. Back in May, he thought the only threats to his garden were aphids and cutworms” (Porter, 2008, para. 12).

Despite the recent popularity of urban greening, and plethora of evidence documenting the beneficial effects of exposure to nature on health, community development and resiliency, (Armstrong, 2000; Frumkin, 2001; Kaplan, 1995; Krasny, Tidball, & Broussard, 2008; Kuo & Sullivan, 2001; Pretty, 2005; Salllis & Glanz, 2006; Talbot & Kaplan, 1986; Ulrich, 1984; Wells, 2000; Wells & Evans, 2003) community gardens remain vulnerable to displacement without continued momentum towards increased public support (Kurutz, 2004; Martin, 1999; Pothukuchi & Kaufman, 1999; Schwartz, 2006; Twiss et al., 2003). The two major factors that can threaten public support are: (1) competing land-use needs; and (2) mistaken, and sometimes negative, impressions of community garden aesthetics. The literature on these two themes will now be presented.

Competing land-use needs

Community gardens are threatened by competing ideas of how the land should be used (Francis, 2003; Lange, Hehl-Lange, Brewer, 2007; Schmelzkopf, 1995; Schwartz, 2006; Smith & Kurtz, 2003; Tidball & Krasny, 2007). In order to preserve the land for community gardens, many urban community "greeners" have had to fight to defend the "right to use land that more powerful city government and business interests would like to develop commercially" (Tidball & Krasny, 2007, p. 9).

A general lack of awareness regarding the benefits of community gardens contributes to the threat of development. This is partially due to the fact that other types of land-use are much easier to valuate, especially in a market economy. Benefits calculations of urban greenspace are not as straightforward as other public commodities (Schmelzkopf, 2002; Wolf, 2004),

such as libraries, police and firefighters (K. Tidball, personal communication, March 4, 2008) public housing, (Schmelzkopf, 2002) or commercial development (Francis, 2003). And yet, while parks have no direct economic benefits, they are legitimized as permanent public amenities (Lawson, 2004).

Eyesore impression

Unlike parks and greenspace, community gardens are sometimes misunderstood or perceived negatively. In the Summer of 1999, the Harmony Community Garden in Harlem, New York was bulldozed (Martin, 1999). While longtime residents who had participated in the garden were heartbroken, some newer residents of the area shared the sentiment of Walter King, who reported, “my very strong feeling is that this is an eyesore” (Martin, 1999, para. 7).

Common complaints about community garden are that they appear disorganized and unwelcoming (Been & Voicu, 2006; J. Litt, personal communication, December, 26, 2007; Schmelzkopf, 1995; K. Tidball, personal communication, August 21, 2007). Traditional landscaping involves efforts to plan and design settings that make sense, because people like scenes that are well-maintained (Wolf, 2004), visually coherent, and legible (Kaplan & Kaplan, 1982). This can be problematic for community gardens, as each plot (or section) of a community garden is “designed” by a different person, and there is usually a range of age, culture, experience level and intentions amongst the gardeners, the gardens often display of a wide array of differing visual stimuli from one square foot to the next. In many urban community gardens, even those that are well-maintained, aesthetics that “make sense”

are not as high on the list of priorities as providing a means for affordable healthy food, for instance (Schmelzkopf, 1995).

Seasonality

The "eyesore" impression regarding community gardens is intensified by seasonal effects on garden aesthetics, especially the winter, when they can appear "unkempt and lifeless" (Lawson, 2005, p. 300). For instance, in Battery Park City, residents with a view of Liberty Community Gardens reported to Steven Kurutz of the *New York Times*, that the garden was an "eyesore," (Kurutz, 2004, para. 3) particularly in the winter. They referred to the garden's barren aesthetics in the off-season as reminiscent of a "graveyard" (Kurutz, 2004, para. 3). The significance of seasonality on garden aesthetics is quite substantial; as in many areas of the United States, gardens are in a dormant state more than half of the year.

Unwelcoming appearance

The third common negative impression of CGs, that they are unwelcoming, may be a result of circumstances of their history. Many of New York City's community gardens came to be during a national environmental movement combined with the city's fiscal crisis in the early 1970's (Schmelzkopf, 2002). Out of these circumstances, the *guerrilla gardening* movement was born (Parks & People Foundation, 2000). Guerrilla gardening is essentially the reclamation of neglected property, oftentimes derelict and unmaintained, for the use of gardening and other community development uses (Parks & People Foundation, 2000; Schmelzkopf, 1995). Guerrilla gardeners would often employ methods that were spontaneous and even

illegal, such as trespassing. Gardeners had, and still have a reputation for being opinionated politically, and they will sometimes share their messages of dissent in public art in the gardens. For instance, at the 6th Street and Avenue B Garden, in New York City, for nearly two decades, a huge "tower of toys" (Figure 1.2), stood above the block (Schmelzkopf, 1995) and received intense reactions from passersby. It was taken down in May of 2008.

> It wasn't beautiful, but it was beautifully eccentric, part of a folk-art tradition put together from the detritus and wreckage of once-raggedy neighborhoods by individuals working on the edge of society. Adam Purple's glorious "Garden of Eden" on Eldridge Street was torn down in 1986; the metal-sculpture garden on Avenue B and East 2nd was evicted in 1995. And last week, the Tower of Toys came down. All of these projects, and others elsewhere in the city, served as demarcation lines, stopgaps against encroaching gentrification. Now there aren't any peripheries in Manhattan, and there are few anywhere in the city. Everything has a price. Everything except outsider eccentricity, which evidently is bad for business (Saltz, 2008, para. 4).

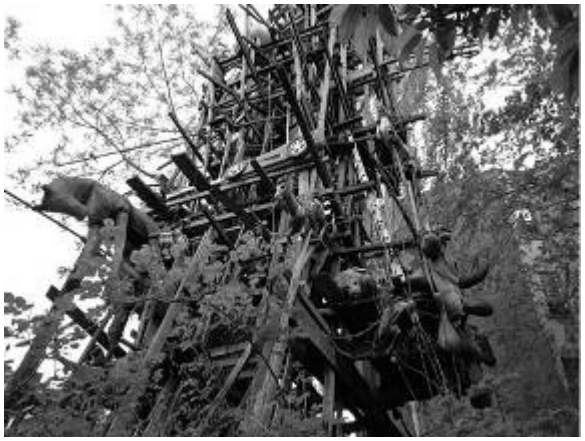

Figure 1.2: "Tower of Toys" 6th Street + Avenue B Garden, New York City. Photo credit: Will Femia (Saltz, 2008)

Why is Public Support Necessary?

Building and maintaining support from a broad-based constituency is essential for the sustainability of any public amenity (Twiss et al., 2003; Lawson, 2005; Schmelzkopf, 1995), and the community garden is no exception. "Public support for gardens is necessary for acquiring land, funding programs, and increasing community involvement" (Lawson, 2005, p. 300). Sustainability of gardens is dependent on more than just fiscal backing. An investment in the protection, preservation, and promotion of community gardens is necessary; based on an understanding of their value as a commodity to the urban community.

Research Aims

Given the great value of community gardens, and the need to maintain the trend of increasing public awareness and support, there is an urgent need to understand the factors that contribute to the impression of this ssetting. This thesis will examine two main topics: (1) how physical features of urban community gardens affect public impression; and (2) how expertise moderates the relation between garden features and impression.

LITERATURE REVIEW: AESTHETICS, BACKGROUND AND IMPRESSION: WHAT INFLUENCES US?

To address impression of urban community garden aesthetics, it is useful to first consider landscape typologies, effects of expertise, and salient components of impression based on literature from environmental psychology, landscape design, and city planning. There are three common factors

mentioned throughout the environmental psychology literature, suggesting factors that influence people's impressions: evolution and self-preservation, culture, and expertise

Evolution and Self-Preservation

People are a product of evolution and the processing of environmental stimuli is critical for survival (Herzog et al., 1982; Appleton, 1975). Not only do humans prefer environments that afford health and wellbeing, but they tend to dislike environments that do not (Herzog et al., 1982; Purcell, Peron, & Berto, 2001). In a study conducted by Herzog et al. (1982), which compared preference for a variety of unfamiliar urban environment categories, the "alleys and factories" category was distinctly disliked (while "urban nature" was associated with the highest preference ratings). Herzog et al. (1982) hypothesize that the reasoning behind this is that there is a link between preference for an environment and how it supports human life. The research of Purcell et al. (2001) supports this, in that they found evidence that the restorative value of a scene is an implicit frame of reference for preference judgments.

Culture and Societal Values

Landscape impression is also influenced by preconceived schema (Kaplan & Kaplan, 1982) based in one's culture and/or background (Purcell, Peron, & Berto, 2001; Kaplan & Kaplan, 1982). The extent to which the nascent community garden landscape typology fits in to age-old established ideals of landscape aesthetics, is likely to affect how it is perceived.

Maintenance style: Formal and informal

The formal "high culture" (Moore-Colyer & Scott, 2005, p. 506) landscape style has been extremely influential in Western landscape design (See Figure 1.3). This has significant implications for public support of community gardens in the United States, as many people from Western cultures tend to idealize the formal public garden, derived from French estate gardens of the eighteenth century. These gardens are recognized by their highly regular, geometric, symmetrical, restrained aesthetic style (Hubbard & Hubbard, 1917; Newton, 1971; Nohl, 2001).

Figure 1.3. Example of French Formal Garden. Abbaye de Valloires, France. Photographer: Wolf Meusel (http://en.wikipedia.org/wiki/File:04-06-12_Valloires-_Abbaye_de_01.JPG).

While the formal landscape has been highly idealized, this is not to say that the more organic, irregular, "informal" landscape style developed in England in the eighteenth and nineteenth centuries does not have as revered a place in Western culture (Newton, 1971) (See Figure 1.4). Frank Edgerton Martin, landscape historian and journalist, explains that "our entire national American landscape ideal is based on some kind of idealized notion of England going back to the nineteenth century" (O'dell, 2008, p. 211). This

"pedigreed landscape," (Hough, 2004, p. 6) has been "represented in painting, poetry, letters and philosophy, and has become a symbolic touchstone of social value" (Moore-Colyer & Scott, 2005, p. 502).

Figure 1.4. Example of English "Informal" Garden. Historical Landscape Gardens of Claremont, in Surrey, England. Photographer: James Long (http://en.wikipedia.org/wiki/File:Claremont_Belvedere.jpg).

It is important to note that an "informal landscape" will not always appear as the extreme opposite of the "formal landscape," as is evident when comparing Figures 1.3 and 1.4. And while urban community gardens are almost without exception informal in style, a planned, highly manicured "informal" community garden could be considered quite "formal" in comparison to a highly spontaneous maintenance style of an "informal" community garden.

Urban landscape: A cultural landscape

Nassauer (1995, p. 229) proposes that "human landscape perception, cognition, and values directly affect the landscape and are affected by the landscape". As the world's landscapes become increasingly urbanized, humans have tried to reconcile their desire to retain the beloved natural aesthetics with the reality of the dense built environment. The result is c*ultural*

or *humanized* landscapes: landscapes created by the combined work of nature and man (Hough, 2004; Hubbard & Hubbard, 1917). Therefore; the urban community garden vernacular fits this definition of a cultural landscape, in that it is created by a combination of natural, fortuitous, social, and cultural forces and processes (Hough, 2004). The maintenance style of the community garden depends on the culture of the gardeners.

Experience and Expertise

The third factor influencing impression of landscape aesthetics is *expertise*. In the context of this research, experts are defined as people with different levels and/or types of experience with a setting (Devlin & Nasar, 1989; Kaplan & Kaplan, 1982; Kaplan & Herbert, 1987; Purcell 1986). As Purcell (1986, p. 6) comments, impression of an environment is a result of "incoming information from the environment and the stored representation of prior experience with similar environmental situations." Impression differences for "experts," people with more experience, versus "nonexperts," people with little or no experience, appear in a variety of domains including architecture (Devlin & Nasar, 1989), home safety (Wells & Evans, 1996), and natural environments (Talbot & Kaplan, 1986; Wilkie & Roach, 2004).

Experts and natural environments

Previous studies tend to refer to persons with practical experience or exposure to the topic (or environment) of interest not as "experts," but as persons who are more *familiar* with the environment of interest (Devlin & Nasar, 1989; Kaplan & Herbert, 1987). In the current study, however;

community gardeners, while definitely familiar with urban greenspace aesthetics, are also considered experts in their own right.

Previous studies have found interaction effects between type of experience and physical features on impression. In a study by Kuo, Bacaicoa, & Sullivan (1998), for example, photo simulations were used to elicit reactions to the planting of trees in an area near a Chicago public housing high-rise. Building administrators and city police reported that in their opinion, the integration of trees would decrease residents' sense of safety. However; results showed that "residents felt strongly that trees would not decrease their sense of safety" (Kuo, et al., 1998, p. 36).

Expertise and impression

In various design fields, such as art, architecture, and landscape design, for example, there are usually general modes of consensus in terms of what is seen as valuable. However; this consensus does not usually hold from expert to non-expert. For instance, in a study by Devlin and Nasar (1989), respondents, including architects and the lay public, were asked to rate photos of both "high" and "popular" architecture. Architects favored "high" architecture with complexity in the features, while non-architects favored simplicity and "popular" architecture (Devlin & Nasar, 1989). The issue of design expertise influencing impression can be translated across many contexts, even those where intentional design is not necessarily a part of the creation process, as is the case with community gardens.

Evolution, culture, and expertise are all influential in the formation of impression of landscape typologies. Once impression of a landscape typology

is formed, the successive process is the decision of whether or not to support its existence.

Urban landscape impression and public support:

> Aesthetic reactions reflect neither a casual nor a trivial aspect of the human makeup. Aesthetics is not the reflection of a whim that people exercise when they are not otherwise occupied. Rather, such reactions appear to constitute a guide to human behavior that has far-reaching consequences… Aesthetics could thus be seen as a set of inclinations, however intuitive or unconscious, which might influence the direction people choose not only in the physical environment but in other domains (Kaplan, 1987, p. 26).

There are incredible complexities, nuances, and dimensions to how specific features, types, arrangements, and densities of features in the landscape affect impression (Appleton, 1975; Francis, 2003; Gallagher, 1977; Kaplan, 1985; Kaplan, 2001; Kaplan, 2007; Kaplan & Kaplan 1989; Kaplan, Kaplan, & Wendt, 1972; Kuo, Bacaicoa, & Sullivan, 1998; Purcell, Peron, & Berto, 2001; Ulrich, 1984; Wells & Evans, 2003).

Three themes of landscapes are commonly examined as predictors of impression. They include: (1) trees and other natural features (and maintenance style thereof); (2) cultural features (including built features); and (3) openness of views. Within these studies, two components of impression are often examined as dependent variables: *preference* and *sense of safety*. While very few studies have included *sense of public value* as a measure of impression, it is an important component, especially when the issue public support is in question.

Trees and other natural features and impression

Among the physical features that have been examined in past studies as predictors of impression, trees and other natural features are the most popular subject. In general, urban forestry is appreciated by the majority of people (Herzog, Kaplan, and Kaplan, 1982; Krasny et al., 2008; Kaplan, 1985; Tidball & Krasny, 2007; Ulrich, 1986; Wolf, 2004). For example, in a study conducted by Kuo, Sullivan, Coley, and Brunson (1998) at the Robert Taylor Homes, a public housing development in Chicago, findings showed that spaces with more trees were used more by residents than spaces without trees. A study of urban nature found trees to be the most powerful predictor of preference, and increased size and number of trees enhanced preference ratings as well (Gallagher, 1977).

Maintenance style. There is considerable evidence (e.g., Kaplan & Austin, 2004; Kaplan & Kaplan 1989; Özgüner & Kendle, 2005) that the level of formality, meaning organization and maintenance level and style, of natural features has significant effects on impression. An example of preference for formal landscapes comes from a study by Kaplan and Austin (2004), where residents' impressions of nearby nature in a suburban area in southeastern Michigan were examined. They found that the manicured/landscaped typology received the highest preference rating of all the natural area categories (Kaplan & Austin, 2004).

As the organization of elements in formal landscapes are correlated with preference, studies show that aesthetic organization in terms of *maintenance* is also correlated with sense of safety (Kuo, Bacaicoa, & Sullivan, 1998; Schroeder & Anderson, 1984). In a study by Schroeder and

Anderson (1984) which examines perceived security of urban recreation sites, results showed that low security (sense of safety) was associated with undeveloped forested sites and sites where vacant property was evident (Schroeder & Anderson, 1984). Kuo, Bacaicoa, and Sullivan found in their 1998 study that grass maintenance (as well as tree density) was associated with increased sense of safety, as well as preference.

Cultural features

The great diversity in culture and background found in New York City neighborhoods is one of the most influential factors on the physical content and style of its community gardens. The range of values and needs of each gardening community determine the extent of formality or informality in style of each individual garden. Because community gardeners are often such a diverse group, and because they tend to identify themselves as partners with nature in the garden "design," there is a tendency towards informal.

Some specific physical features which reveal community identity and illustrate the presence of social activity include artwork, flags, garden décor, casitas, gazebos, bulletin boards, seating and tables, and open areas for gathering, dancing, playing, picnicking, etc. These features make it possible to get an idea of who the gardeners are, and what social activities go on there aside from gardening (Schmelzkopf, 1995).

Many physical features in the gardens located in Harlem, El Barrio and Lower East Side neighborhoods are clear representations of the local residents' cultures, which are largely Hispanic or Latino (Saldivar-Tanaka & Krasny, 2004). An enormously prevalent feature found in these gardens is the "casita," (Figures 1.5 and 1.6) which is Spanish for "little house". Casitas are a

vernacular structure, which reference the dwellings of rural and poor urban areas of Puerto Rico and the Dominican Republic (Jopling, 1991; Saldivar-Tanaka & Krasny, 2004; Suutari, 2008). While the casita can be compared to the gazebo in terms of function as a gathering space and shade, the fundamental difference is the process of construction and resulting appearance. Casitas tend to be built in the gardens from the ground up, using local scrap materials, and are usually painted bright colors (Suutari, 2008). Gazebos tend to be built from manufactured materials, or are prefabricated kits, and are usually left unpainted (Figure 1.7).


Figures 1.5[2] and 1.6[3]. Examples of Casitas.

Figure 1.7. Example of a Gazebo[4].

[2] (a) Little Blue House Garden Casita
[3] (b) Magic Garden Casita.

It may be difficult to ascertain the value of social activity affordances in a landscape if one has not personally used those affordances, or used them in the specific environment. In a study by Francis (1987), participants included government officials, and users and non-users of the park and community garden. The value of community gardens as a permanent open space was discounted by all government officials interviewed. Francis (1987, p. 107) mentions the sentiment of several officials, one of whom is quoted as saying "I do not see state authorities going for permanent gardens; it is a highly valuable piece of property". Conversely, gardeners saw the property as useful, as a local property value stimulus, and as a valuable social environment (Francis, 1987).

Openness of views

Open views have been found to have an effect on impression, and most frequently, they are found to increase sense of safety. In a study conducted by Nasar, Julian, Buchman, Humphreys, & Mrohaly (1983), Appleton's (1975) prospect-refuge theory[5] was tested in the context of a public park. Spaces with open views were assessed as significantly safer than those with blocked views. A study by Jorgensen, Hitchmough, and Calvert (2002) had similar findings; scenes with full enclosures created by tree and understory density and placement were associated with a low sense of safety, while scenes with no enclosure, which afforded more transparency, were associated with high safety scores (Jorgenson et al., 2002). Findings not only show that open

[4] PBC's Washington Memorial Garden
[5] The theory explains human environmental preference for spaces that afford prospect (open view of potential danger) and refuge (concealment from potential danger) (Appleton, 1975).

views can improve *sense of* safety, but that crime may actually be deterred when visibility-preserving forms of vegetations are used in landscaping (Kuo & Sullivan, 2001; Newman, 1972).

These findings illustrate the complex and interrelated relationships among landscape aesthetics, preference, safety, and sense of public value.

STUDY OVERVIEW - GOALS

Given the importance of shoring up public support for community gardens, the primary goal of this study is to explore what physical features of community gardens predict positive public impressions. The long-term objective of the research is to provide empirical guidance to community garden stakeholders interested in intentional garden design that increases awareness of the benefits available to the community, thus increasing positive impressions and support.

Research Questions

The study addressed the following research questions:

RQ1. How do physical features of Northeastern urban community garden entrance views influence impression, in terms of preference, sense of safety, and public value?

1a. How do individual garden features affect impression?

1b. How do combined features affect impression[6]?

1c. How do community garden setting types affect impression?

[6] Individual features combined based on high correlations.

RQ2. How do variables other than physical features influence impression of community gardens?

2a. How does expertise affect impression?

2b. How does gender affect impression?

2c. How does income affect impression?

RQ3. How does community garden expertise influence the relation between physical features and impression of community gardens?

3a. Does the effect of trees and other natural features on impression depend on expertise?

3b. Does the effect of maintenance style on impression depend on expertise?

Chapter 2

METHODS

In this Methods chapter, first, the research design will be explained. Second, the constructs and measures will be outlined. Third, the survey instrument and procedure for administering the survey will be described. Lastly, details regarding the study site and participants will be given.

RESEARCH DESIGN

This study examines the relationship between community garden features and people's impression of the gardens. Additionally, I will examine how different types of community garden expertise might affect this relation. This was a static comparison of the association between physical features of urban community gardens (e.g., trees, paths, built features, etc.) and "impression" among groups (i.e. laypeople, community gardeners, and urban planners) (Figure 2.1). Three aspects of impression were examined: preference, sense of safety, and sense of public value. The relation between physical garden features and impression was expected to depend upon, or be

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Image Citations:

1) (See page 29): Figure 2.2. Photographer and Survey Designer: Melissa Surratt.
2) (See page 33): Figure 2.3. Photographer and Survey Designer: Melissa Surratt.
3) (See page 35): Figure 2.4. Brisas Del Caribe Community Garden. Photographer: Melissa Surratt
4) (See page 36): Figure 2.5. 6/C Botanical Garden. Photographer: Melissa Surratt.

moderated by, a second independent variable; respondents' community garden expertise (Figure 2.2). In other words, it was hypothesized that there would be an interaction between physical features and expertise.

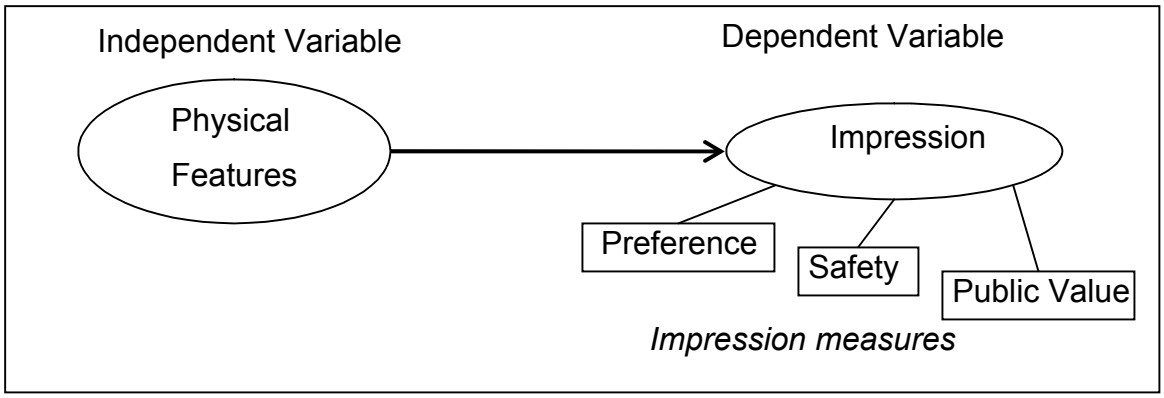

Figure 2.1. Study Design.

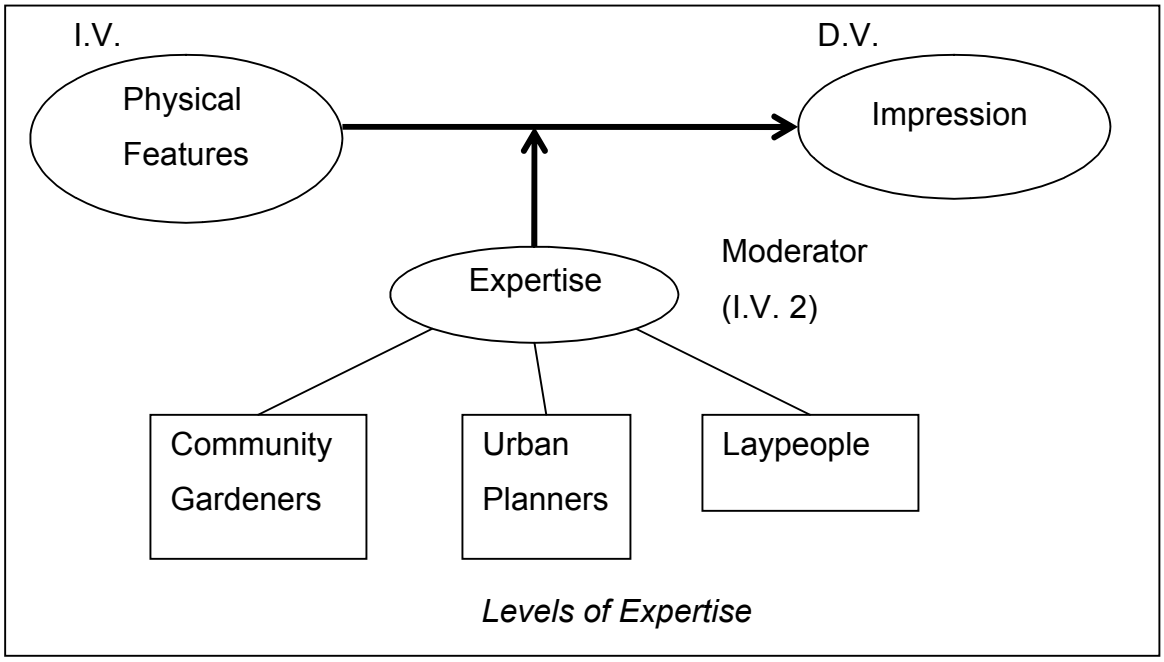

Figure 2.2. Study Design with Expertise as Moderator.

CONSTRUCTS AND MEASURES

Independent Variables

The two main independent variables are: (1) garden physical features (rated by judges who viewed garden photographs); and (2) community garden expertise. Garden physical features were measured in photos of community gardens[7].

Garden physical features

The primary independent variable, physical garden features, was measured in three ways (See Table 2.1 and Figure 2.1). First, eight individual features were rated by judges. Second, these eight features were combined into four feature categories based on correlations among the eight individual variables. Third, four garden setting types were derived based on results from cluster analysis of the features in the photographs.

Table 2.1. Physical Feature Measurements.

a. Individual Features	b. Combined Feature Categories	c. Garden Setting Types
1. Trees 2. Natural features 3. Built features 4. Paths 5. Maintenance Style 6. Openness of View	1. Trees and other Natural features 2. Built features that convey Community identity 3. Built features that	1. Formal, Built, Open 2. Informal, Dense, Natural 3. Informal, Natural, Cultural 4. Informal, Built

[7] Details of photo survey instrument are included at the end of this Methods chapter.

Table 2.1 (Continued).

7. Community Identity 8. Social Activity	facilitate Social activities 4. Cultural (Identity and Social)	Cultural

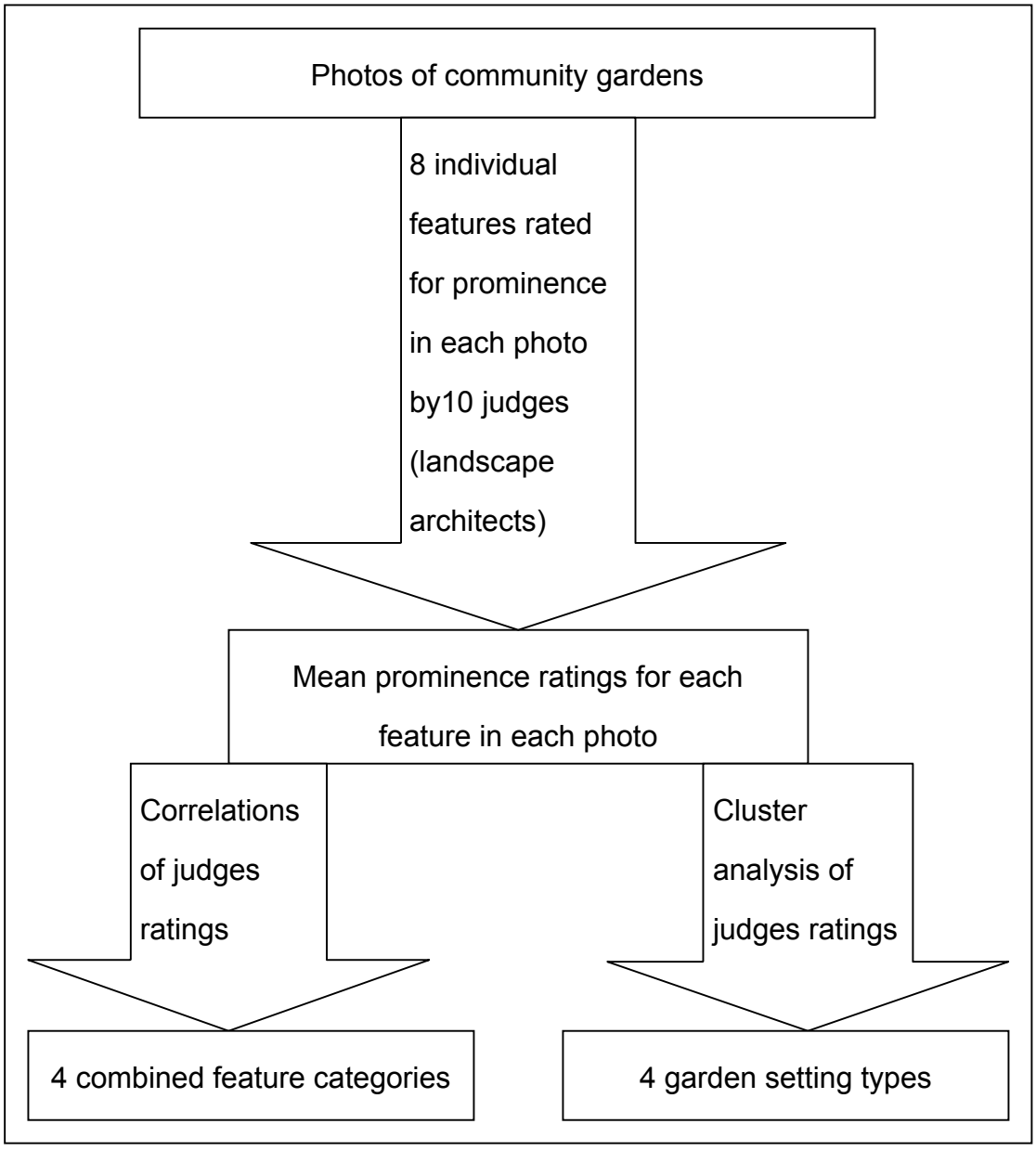

Figure 2.1. "Flow Chart" of Physical Feature Quantification Processes.

Individual features

Eight individual variables represent prominent physical features commonly found in community gardens, most of which can be altered, at least to some extent, by gardeners (Schroeder & Anderson, 1984). Six of the eight physical feature variables were selected based on findings from existing landscape impression literature (Appleton, 1975; Gallagher, 1977; Herzog, Kaplan & Kaplan, 1982; Kaplan & Kaplan 1982; Kaplan & Kaplan 1989; Krasny et al., 2008; Ulrich, 1986): *trees*; *natural elements*; *built features*; *paths*; *maintenance style*; and *openness of view*. Two additional community garden features were included because they are salient features of the community garden landscape, and were thought to provide a more complete analysis. These are: *features that display community identity* and *features that facilitate social activities*. The eight features are listed in Table 2.2, along with the explanations provided to judges who rated them. These feature types are not necessarily mutually exclusive; a specific garden element,(e.g. built features) may represent two or more features (e.g. a built feature that displays community identity).

Table 2.2. Physical Feature Variables Rated by Judges.

The first six variables were rated according to their prominence in the scene, from 1 = non-existent to 7 = very prominent.	
Variable	Definition, examples
Trees	Trees only.
Natural Elements	All foliage, (i.e. trees, shrubs, bushes, flowers, grass, groundcover, weeds, etc.) dirt areas, and rocks/boulders.
Built	Sheds, gazebos, trellises, etc. *within* the garden (does

Table 2.2 (Continued).

Structures	NOT include buildings in the background).
Paths	Paths.
Community Identity Features	Art, flags, decoration, garden accessories, brightly colored (painted) furniture/structures, etc.
Social Features	Features that facilitate social activities, such as seating & tables, playground equipment, bulletin/boards/display cases, areas for gathering/playing/dancing, etc.
The style variable was rated from 1 = very formal to 7 = very informal.	
Style	*Informal style* can be described as naturalistic, spontaneous, wild, or "laissez-faire," and sometimes appears untended. *Formal style* can be described as manicured, with planned organized configurations, such as the traditional 17th Century French garden.
The open view variable was rated from 1 = very limited to 7 = very open.	
Openness of View	How open and clear the views in the setting appear to be; how easy it is to observe all areas of the setting.

Judges. Ten landscape architects served as judges to quantify the level of each of the eight physical feature variables in each of the photos. Landscape architects were selected as judges because they have had considerable experience with landscape scene analysis. Email invitations were sent to graduate students, professors, and alumni of the Cornell University Landscape Architecture department. A ten-dollar gift certificate to a

local store was offered as compensation. The rating task took approximately 30 minutes to complete. The ten judges included eight graduate students, and two professionals.

Ratings were completed using an online survey program, Survey Monkey (SurveyMonkey.com, 2008). Judges were given definitions and examples of the eight physical feature variables to reference as they completed the ratings (Table 2.2). For each photo, judges rated each of the eight physical feature variables on a 7-point Likert scale (Figure 2.2)[8].

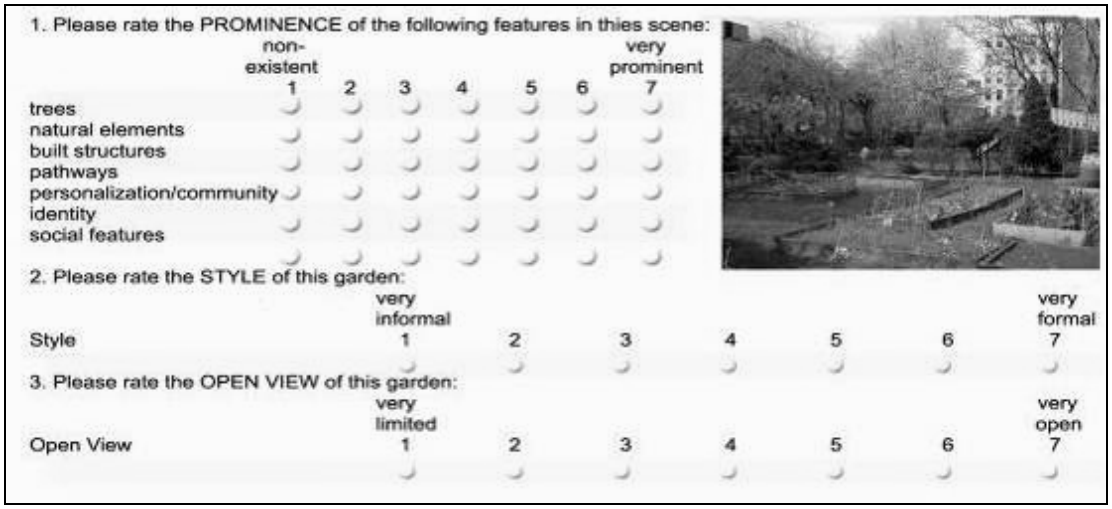

Figure 2.2. Physical Feature Variable Rating Survey for Judges.

Combined feature categories

In order to avoid possible problems with multicollinearity of the garden feature variables[9], correlations were checked among all independent

[8] The average interjudge ICC (interclass correlation coefficient, used instead of Pearson's reliability due to small sample size; < 10) over all the features was 0.91[8].

[9] When independent variables are correlated, this could create collinearity which might render the estimates unstable. Combining the features that are correlated addresses this problem.

variables. Variables with high positive[10] correlations were combined by averaging the ratings, resulting in four combined feature categories[11]:

(1) Trees and other Natural Elements ("Tree-Nature");

(2) Built features that convey Community Identity, ("Built-Identity")

(3) Built Features that facilitate Social activities, or "Built-Social"; and

(4) Features that convey Community Identity and facilitate Social activities, or "Cultural".

Table 2.3: Correlations of 8 Individual Physical Features.

Pearson Correlation	Trees	Natural Elements	Built Structures	Pathways	Community Identity	Social Features
Trees	-					
Natural Elements	**0.74***	-				
Built Structures	-0.80*	-0.85*	-			
Pathways	-0.22*	-0.01	0.01	-		

[10] Negative correlations were not included. Negative correlations signify that when one feature increases, the other feature decreases. While variables with negative correlations would also help to address multicollinearity, these combinations were not included in this analysis. In addition to addressing multicollinearity, the intention here was to analyze combinations of features with levels that increase/decrease in the same direction. Negatively correlated combinations should be addressed in future research.

[11] Correlations with "open" and "style" are not the same because the rating scale for them meant something different than the rest of the physical features.

Table 2.3 (Continued).

Community Identity	-0.58*	-0.82*	**0.82***	-0.16*	-	
Social Features	-0.46*	-0.70*	**0.75***	-0.12*	**0.64***	-

* Correlation is significant at the 0.01 level (2-tailed).
** Correlation is significant at the 0.001 level (2-tailed).
Bold: positive correlations included in the analysis of Combined Feature Categories.

Garden setting types

To define garden setting types from the community garden photos, the judges' ratings of the garden physical features were subjected to K-means clustering[12] (SPSS Institute Inc., Chicago, IL, 2004). This method allows us to evaluate impression of certain types of community gardens, instead of just the features within the gardens.

Expertise as a moderator

The second independent variable, expertise, was included in the study as a possible moderator variable. As was mentioned in the previous chapter, . in the context of this research, experts are defined as people with different levels and/or types of experience with community gardens. Laypeople, community gardeners, and urban planners were included as participants in the study in order to compare how different types of community garden expertise

[12] K-means clustering is a data reduction procedure for the independent variable. For the purposes of this study, while every scene is made up of an infinite combination of different physical features, scene types of community gardens can be grouped based on their most prominent features. Cluster analysis of the photos, based on the judges' ratings of the physical features in each photo, provides a way to systematically group photos that hang together.

affect impression. To measure expertise, the survey included questions at the end of the survey about gardening and planning experience. Respondents were asked “Are you a gardener?” and “Have you ever participated in a community garden?” and “Do you have professional experience in the field of City Planning/Design?”

Demographics and other variables of interest

Demographic information (i.e.; age, gender, race, ethnicity, and household income) was included. Additionally, to examine how impression might be affected by the type of city/town (i.e. rural vs. urban) a respondent is familiar with, they were asked to give their zip code, which could then be converted to population-density data using ESRI Geographical Information Systems (G.I.S.) shapefiles from the U.S. Census 2000 (ESRI, 2008).

Dependent Variables: Preference, Sense of Safety, and Public Value

The three facets of the dependent variable, impression, are: (1) preference; (2) sense of safety; and (3) sense of public value; these were rated by participants in a photo survey. Each photo in the survey was introduced to participants with: “This is a view of a community garden from the street. Imagine this garden in your own neighborhood.” (See Figure 2.3 below).

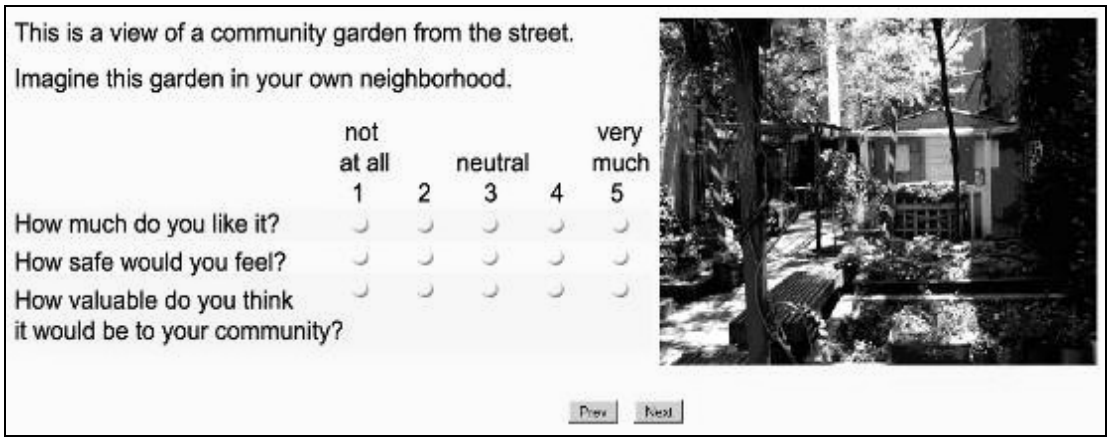

Figure 2.3. Example of Survey Page.

The measure for preference was "How much do you like it?". The safety measure was "How safe would you feel?". Public value was measured by asking "How valuable do you think it is to your community?". The 5-point response scale for each of the 3 items went from 1 = "not at all" to 3 = "neutral" to 5 = "very much." Correlations among these items are very high (≥ 0.67) and are outlined in the table below (Table 2.4). The high correlation among these three variables supports the assertion that they are measurements of the same thing, which we have labeled "impression".

Table 2.4. Preference Safety and Public Value Correlations.[13]

		Preference	Safety	Public Value
Preference	Pearson Correlation	1	0.67*	0.78*
	Sig. (2-tailed)		0.00	0.00
	N	10950	10950	10950
Safety	Pearson Correlation	0.67*	1	0.70*

[13] While the total number of participants in this study was 365, the N = 10950 in this table due to the fact that there are 30 observations (of each photo) for every participant, so there are 10950 (365 x 30) unique pieces of data for preference, safety, and public value.

Table 2.4 (Continued).

	Sig. (2-tailed)	0.00		0.00
	N	10950	10950	10950
Public Value	Pearson Correlation	0.78*	0.70*	1
	Sig. (2-tailed)	0.00	0.00	
	N	10950	10950	10950

* Correlation is significant at the 0.01 level (2-tailed).
** Correlation is significant at the 0.001 level (2-tailed).

STUDY SITE: NEW YORK CITY COMMUNITY GARDENS

New York City has been a major hot spot for community garden land-use controversy over the past two decades (Schmelzkopf, 1995; Smith & Kurtz, 2003; Schwartz, 2006), and was therefore chosen as the study site. There are hundreds of community gardens in Harlem and the Lower East Side, and great aesthetic diversity due to varied cultural influence, vegetation, and use, can be seen from one garden to the next (Schmelzkopf, 1995). The amount of land covered by these gardens ranges in size from barely 100 square feet tucked in narrow corridors, up to two acres (the former being far more common).

Figure 2.4. Example of Community Garden Scene Included in the Survey with Both Natural and Built Features[14].

Gardens were sampled based on capturing a variety of prominent content (Figure 2.4). Trees ranged from small potted saplings to massive pines and London plane trees. Natural elements included everything from dirt terrain to a variety of groundcover. Built structures consisted of raised beds, trellises, gazebos, and casitas. The sampled gardens included different types of pathways, from dirt trails to stepping stones to concrete walkways to designed pattern brick paths. A variety of features that reveal community identity, such as art, flags, garden accessories, and brightly colored furniture/structures were incorporated in the scenes sampled. Various features that facilitate social activities, such as seating and tables, playground equipment, and areas for gathering were present in the photographed gardens. Views captured in the photos ranged from very limited to very open.

[14] Brisas Del Caribe Community Garden.

Figure 2.5. Example of a More Formal Community Garden Scene Included in the Survey[15].

The community gardens sampled varied in landscaping style. While a full continuum of landscape style would span from very informal to very formal (Figure 2.5), the majority of Northeast U.S. urban community gardens fit into the more informal side of the spectrum. They range from moderately formal; very manicured with planned configurations, to very informal; naturalistic and spontaneous.

INSTRUMENT: PHOTO SURVEY

The instrument chosen for this study was a photographic survey. Reliability of the measurement was tested by a pilot group of 21 people who completed the survey twice, and it was found to be reliable[16].

[15] 6 B/C Botanical Garden.

[16] Pearson Product-Moment Correlation Coefficient: r=0.65

Photographs

Photographs[17] of the community gardens were taken at the beginning of the growing season[18] to keep the seasonality aesthetics consistent to a moderate amount of lushness, greenness, and density. Thirty photos representing twenty-eight gardens[19] in the Upper East Side and Harlem were selected for their understandability, photographic quality, composition, and physical content. Photos taken from the perspective of someone who would see the site from the street while passing by were selected.

PROCEDURE

Recruitment

Invitations were emailed to the three groups of interest by using the "snowball sampling" method.[20] To recruit planners, Northeast U.S. planning firms in urban areas were contacted by phone, a general office email address was requested, and the invitation was sent. Community gardeners were invited through an email sent to the American Community Gardening Association (ACGA) listserv. Laypeople were recruited through the Cornell

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[17] The argument might be made that the determination of perception by looking at a photograph is not as accurate as having respondents physically in the setting. While this may be true, it seems a worthwhile tradeoff for the elimination of issues that could detract from the independent variables of interest if subjects were in the actual physical space (ie; traffic noise, weather, etc.) (Kaplan & Kaplan, 1989). Additionally, while it is difficult for people to verbalize their feelings about an environment, it is much easier for people to rate how much they like a scene in a photo (Herzog et al., 1982; Kaplan & Kaplan, 1982).

18 April 2008.

19 Two of the 28 gardens were represented in two photos each; the rest of the gardens were only represented by one photo each.

20 "Snowballing" is a technique which develops a research sample from a small group of study subjects, who then recruit future subjects from among their acquaintances. If these acquaintances decide to participate, their responses are analyzed no differently than the original participants contacted.

University, College of Human Ecology, Department of Design and Environmental Analysis (DEA) alumni list. Nearly 2,000 total invitations were emailed; 32 to planning firms, 944 recipients on the ACGA listserv, and 834 to DEA alumni. Unfortunately, it is not feasible to determine how many more people received the email invitation through the snowball sampling method. No follow-up reminders were sent.

Administering the Survey

An email invitation informed the recipient that the study was about "impression of community gardens," and was being conducted as part of the Principal Investigator's Master's thesis. Entry into a lottery to win an iPod Shuffle™ was offered as an incentive to participate, and it was explained that there were four chances to win. Participants were informed that the survey would take less than 20 minutes to complete. A link to the online survey was provided. When the link was "clicked," the subject consent page opened in a new browser window. When participants checked "I consent to the above conditions," they were directed to the next page, where the survey began.

PARTICIPANTS

Three groups of participants were targeted: (1) laypeople living in the U.S.; (2) city planners in urban areas in the Northeastern U.S. urban firms; and (3) community gardeners from around the United States. Selection criteria for the layperson sample specified that they did not have gardening experience nor professional city planning experience.

Demographics

Of the 429 people who started the survey, 365 completed it. Accounting only for the primary invitations that were sent out (1,810), the response rate was 20%. An adequate sample for each of the groups of interest was acquired; 51 laypeople (non gardeners, non community gardeners, non planners), 24 planners (non gardeners, and 143 community gardeners (non planners). Table 2.5 shows an overall sample population breakdown.

Table 2.5. Participant Group Samples

Gardener?	N	%	Community Gardener?	N	%	Planner?	N	%
Yes	278	76.16	Yes	174	47.67	Yes	31	8.49
						no	143*	39.18
			No	104	28.49	yes	27	7.40
						no	77	21.10
No	87	23.84	Yes	12	3.29	yes	6	1.64
						no	6	1.64
			No	75	20.55	yes	24*	6.57
						no	51*	13.97
								Total N=365

* Sample groups of interest; specifically targeted for this study.

The demographic breakdown by expertise group is show in Tables 2.6 - 2.9. Many more women (79%) than men responded to the survey. The

majority of respondents described their race or ethnic background as “white” (88%). A considerable percentage (27%) of respondents reported that their household income was over $100,000.

Table 2.6. Target Groups: Age and Gender.

	Age					Gender	
	18-25	26-35	36-50	51-69	70+	Male	Female
Community Gardner	11	27	43	57	5	30	113
Planner	6	11	5	1	0	9	14
Layperson	20	17	9	5	0	11	40

Table 2.7. Target Groups: Ethnicity and Race.

	Hispanic/ Latino		Race			
	Yes	No	Black/ African American	Asian	White	Other
Community Gardner	2	140	4	0	129	8
Planner	0	22	2	1	20	0
Layperson	1	50	0	7	41	1

Table 2.8. Target Groups: Level of Education.

	High School Graduate (or GED)	Some College	College Graduate	graduate school 2 +

Table 2.8 (Continued).

Community Gardener	4	31	59	49
Planner	0	0	11	12
Layperson	1	1	28	21

Table 2.9. Target Groups: Income[21].

	$0 - $9,999	$10,000 - $19,000	$20,000 - $29,000	$30,000 - $49,000	$50,000 - $74,000	$75,000 - $99,000	$100,000 +
Community Gardner	5	2	6	26	27	20	30
Planner	0	0	0	5	6	0	6
Layperson	0	1	2	3	8	5	16

A broader ethnic sample would be of definite value in future studies[22]. However; this study focuses primarily on a group which is prolific in decision-making roles in this country; white upper class white women. A strength of this study's sample is their influence in public policies having to do with land-use, such as that which could be designated for community gardens.

[21] Not included in this table: respondents who chose "not sure" or "prefer not to answer".
[22] See Chapter 4 for further discussion on limitations of skewed demographic makeup of sample.

Chapter 3

RESULTS

The Results section is organized by the three research aims. Aim 1 addresses how physical features of community gardens predict impression. Aim 2 focuses on assessing potential main effects of variables other than physical features. Aim 3 deals with how community garden expertise influences the relation between the physical characteristics of community gardens and impression.

RESULTS OF ANALYSIS

Hierarchical linear modeling (HLM) was applied to evaluate to what extent the physical features of the gardens account for impression of urban community garden environments. Regression analysis was used to examine the interaction effect between physical features and expertise on impression.

Impression Factor. Because correlations between preference, safety, and public value are significant ($r \geq 0.67$), factor analysis was used to combine variables into one "impression" component. When these variables are factor analyzed, one overarching factor preserves 81% of the total variance of all three factors[23].

[23] This *impression* factor refers positive and negative impression. Factor analysis yields a continuous measure from -1 to 1; normalized around 0. The closer to -1, the more negative the impression response and the closer to 1, the more positive the impression.

Preliminary Analysis: Gardens Rated Highest and Lowest for Impression

Before examining the relations between features and impression, introductory analyses are presented to gain general familiarity with the data. Figures 3.1 and 3.2 show the two lowest rated garden scenes in terms of overall impression. Figures 3.3 and 3.4 show the two highest rated garden scenes, which happen to be from the same community garden.

Figures 3.1 and 3.2. Photos Receiving the Lowest Impression Ratings.

Figures 3.3 and 3.4. Photos Receiving the Hightest Impression Ratings.

Aim 1: How Do Physical Features Affect Impression?

Is impression (summarized factor of preference, safety, and public value) influenced by physical features? Aims 1a, 1b, and 1c below outline the three ways I examined the community garden physical feature independent variable.

Aim 1a: How do individual features affect impression?

Hierarchical linear modeling was used to evaluate the relationships among eight physical features (trees, natural features, built features, paths, community identity, social features, style, and open views) and three dependent variables (preference, sense of safety, and public value). Details of the significant main effects of each of the eight independent variables will be discussed below.

Among the eight individual physical features, trees, community identity, style, and open views had the most significant relation to the dependent variables. Table 3.1 shows significance values of the fixed effects.

Table 3.1. Results from HLM Using Physical Features to Predict Impression and Three Components of Impression.

		Dependent Variables			
		Impression *β*	Preference *β*	Safety *β*	Public Value *β*
I.V.s	Intercept	-3.50	-0.72	0.64	0.11
	Standard Error	0.13	0.16	0.14	0.15
	Trees	0.09*	0.09	0.06**	0.12
	Standard Error	0.09	0.02	0.01	0.01

Table 3.1 (Continued).

I.V.s	Natural	0.29	0.45	0.17	0.28
	Standard Error	0.29	0.02	0.02	0.02
	Built	0.18	0.11	0.04	0.10
	Standard Error	0.08	0.02	0.02	0.02
	Paths	0.01	0.05	-0.04	0.03
	Standard Error	0.01	0.01	0.01	0.01
	Identity	0.03*	0.04****	0.01	0.02**
	Standard Error	0.03	0.01	0.01	0.01
	Social	0.07	0.05*	0.11	0.05
	Standard Error	0.07	0.01	0.01	0.01
	Style	0.17****	0.18****	0.19****	0.15****
	Standard Error	0.17	0.01	0.01	0.01
	Open	0.14	0.09	0.21****	0.14
	Standard Error	0.14	0.09	0.01	0.01

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.005$.
**** $p < 0.001$.

Trees

Trees had a significant effect on respondent's sense of safety (β=0.06, p<0.01) (Table 3.1); a relationship that appears to be quadratic (Figure 3.5). In other words; the relationship is initially positive, but becomes negative as trees increased from "low" to "very high". It is striking that for sense of safety the images with "very low" trees elicited a very similar average response (M=3.32) as "very high" trees (M=3.28). This would seem to indicate that a

"low" to "moderate" level of trees in gardens will provide a greater sense of safety than "very low" or "very high" amount of trees[24].

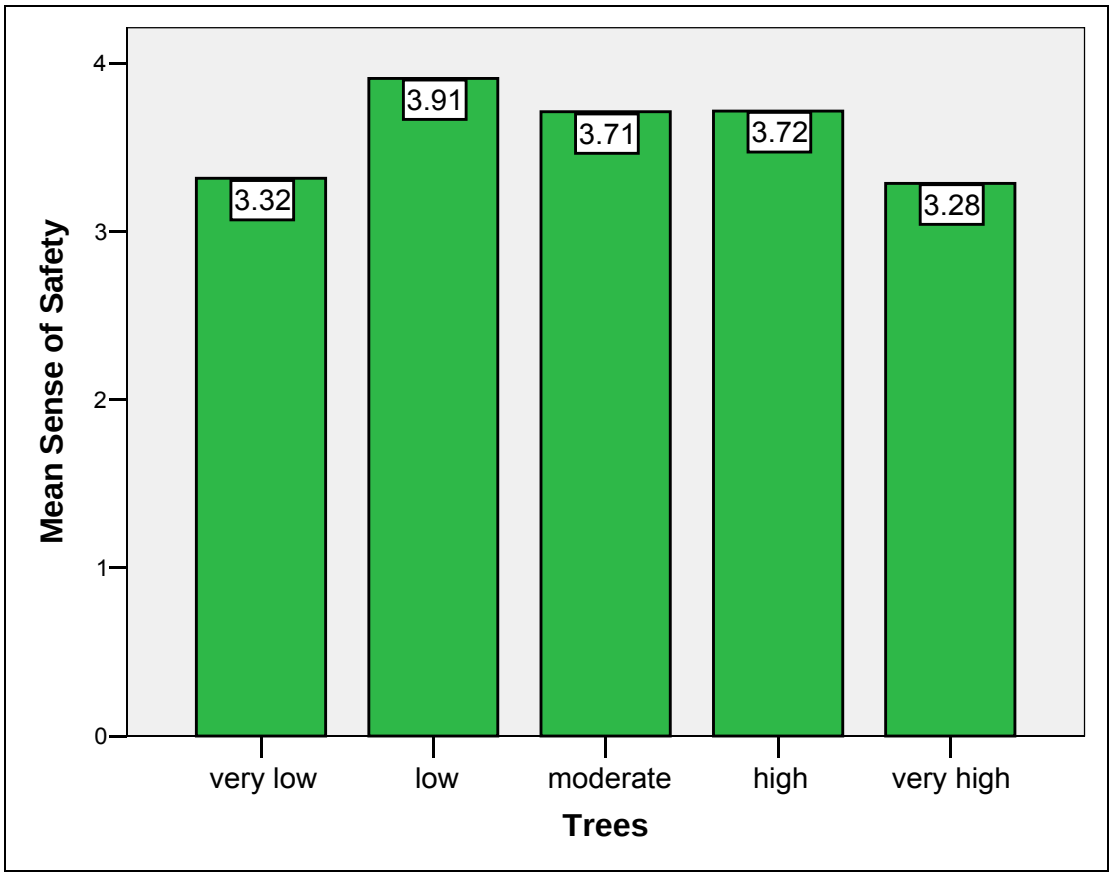

Figure 3.5. Mean Sense of Safety Ratings for Five Levels of Prominence of Trees.

Community identity

The appearance of community identity in gardens had a significant relation to preference (β=0.04, p<0.001), public value (β=0.02, p< 0.01), and overall impression (β =0.03, p<0.05) (Table 3.1). For the most part, respondents gave neutral ratings to the appearance of community identity in

[24] A comparison with these results of the main effect of trees to the interaction between trees and other natural elements later in this section gives a more holistic idea of how impression is influenced.

gardens, however; “very low” Identity is clearly most preferred and rated the highest for public value. While “very low” Identity received high average ratings, it is worth noting that “low” identity received very similar ratings to “very high” identity (See Figure 3.6).

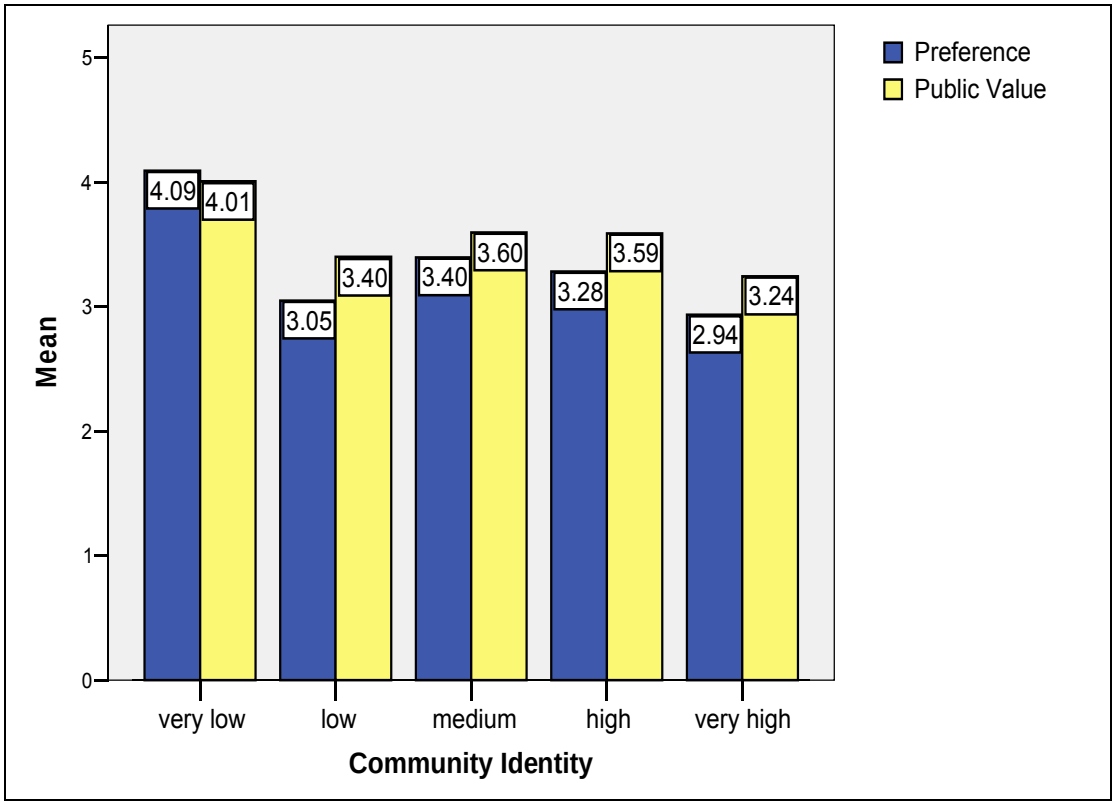

Figure 3.6. Mean Preference and Public Value Ratings for Five Levels of Prominence of Community Identity.

Style

Style had the most significant main effect overall on the three dependent variables, as well as the overall impression factor (β=0.17, p<0.001) (Table 3.1). The relationship is positive; as style changes from the “informal” side of the continuum to the more “formal” side, preference, sense

of safety, and public value all increase[25] (Figure 3.7). Results show that the more formal a garden is, the more it will be liked, elicit a sense of safety, and be viewed as valuable to the community.

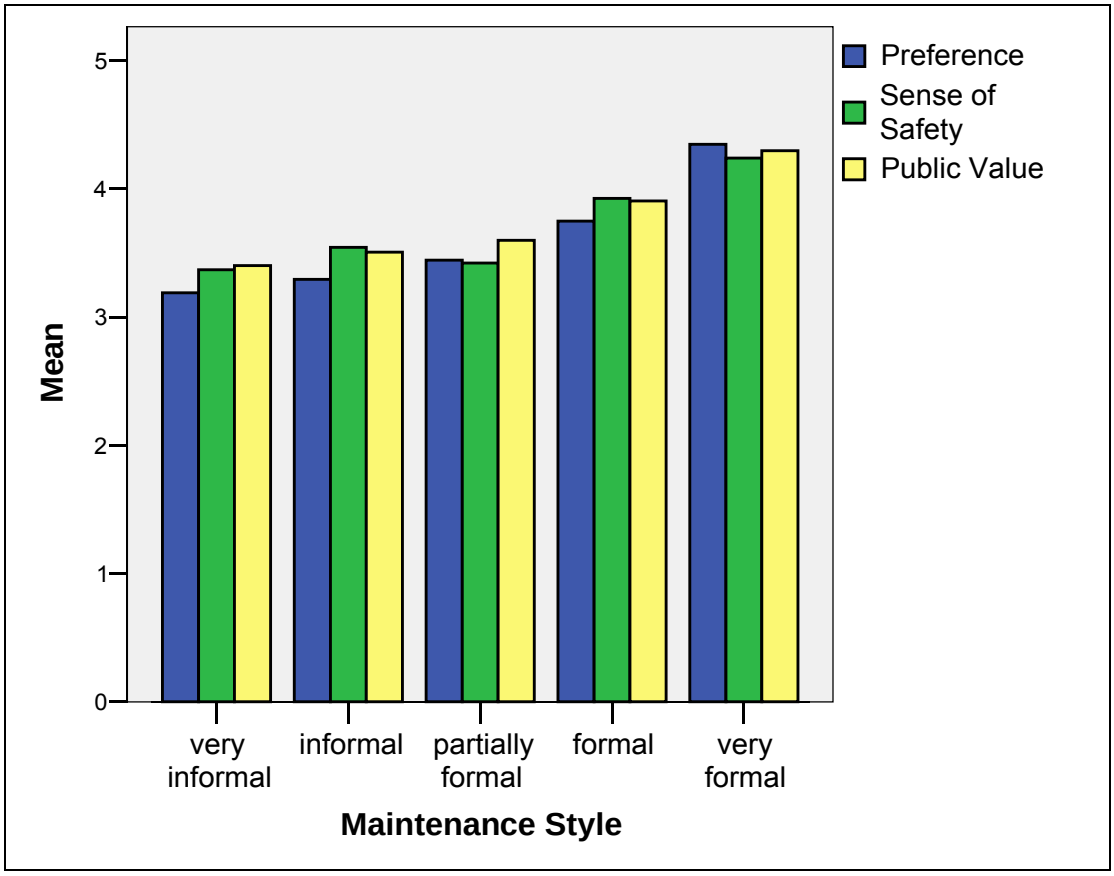

Figure 3.7. Mean Preference, Sense of Safety, and Public Value Ratings Across the Spectrum of Maintenance Style.

Openness of view

The only significant effect of view openness was on sense of safety (β=0.22, p<0.001) (Table 3.1). Gardens with a more open view are seen as safer than gardens with a limited view. "Very open" views received a very high rating for safety (M=4.36); however the safety of gardens with "partially open"

[25] The only exception to this occurred between "informal" and the midpoint on the spectrum, where the mean safety ratings dropped from 3.54 to 3.42.

views still received a high rating (M=3.82). Of all the features evaluated, "very open" views received the highest rating for sense of safety (M=4.36) (Figure 3.8).

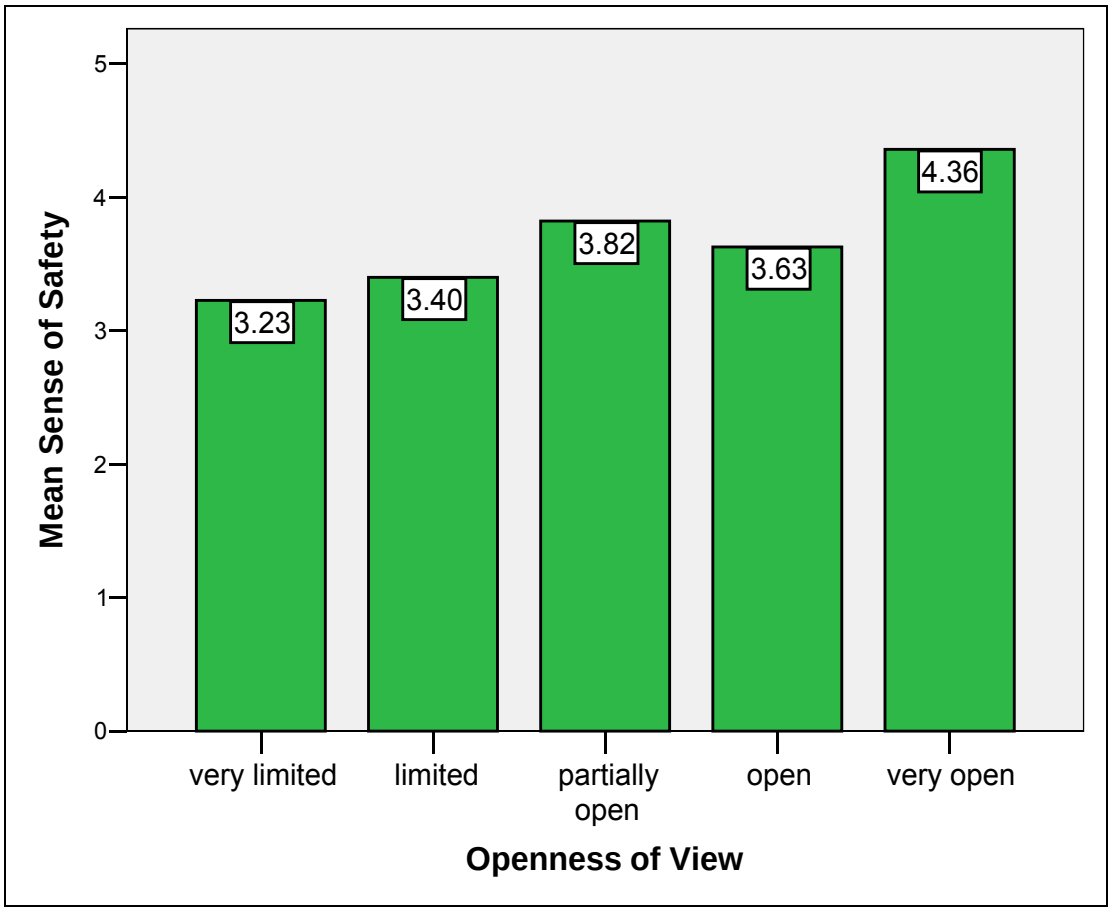

Figure 3.8. Mean Sense of Safety Ratings Across the Spectrum of Openness of View.

Aim 1b: How do combined features affect impression?

As described in the Methods section, the eight individual physical feature variables were reduced to four feature categories[26] (Table 2.3):

(1) trees and other natural elements;

[26] These categories were derived from highly correlated features among the original eight individual features.

(2) built features that convey community identity;

(3) built features that facilitate social activities, and

(4) cultural features.

Hierarchical linear modeling was used to determine the main effects of these four categories on the dependent variables (Table 3.2).

Table 3.2. Results from HLM Using Combined Physical Features to Predict Impression and Three Aspects of Impression.

		Dependent Variables			
		Impression	Preference	Safety	Value
Physical Feature Categories	Intercept *β*	-2.75	0.24	1.18	0.94
	Standard Error	0.11	0.14	0.12	0.13
	Tree-Nature *β*	0.40*	0.54	0.28**	0.40*
	Standard Error	0.01	0.02	0.01	0.02
	Built-Identity *β*	0.20	0.31	0.09*	0.21
	Standard Error	0.02	0.02	0.02	0.02
	Built-Social *β*	0.53	0.56*	0.56	0.49
	Standard Error	0.02	0.02	0.02	0.02
	Cultural *β*	-0.49	-0.66***	-0.38	-0.48*
	Standard Error	0.02	0.03	0.03	0.03

*** p < 0.05.**
**** p < 0.01.**
***** p < 0.005.**
****** p < 0.001.**

Tree-Nature category

While natural elements alone did not have a significant relation to any of the dependent variables (Table 3.1), when combined with the Tree variable significant relationships to safety (*β*=0.28, p<0.001), public value (*β*=0.40,

p<0.05), and impression (β=0.40, p<0.05) are found (Table 3.2). The relationship between the tree-nature category and sense of safety appears to be quadratic; initially positive and then negative after the tree-nature category reaches a moderate level (Figure 3.9). It appears that respondents feel that they would feel quite safe (M=3.82) in gardens with a moderate level of trees combined with other natural elements, however; when this feature is "very low" or "very high" sense of safety is rated lower (M=3.21 and 3.54, respectively).

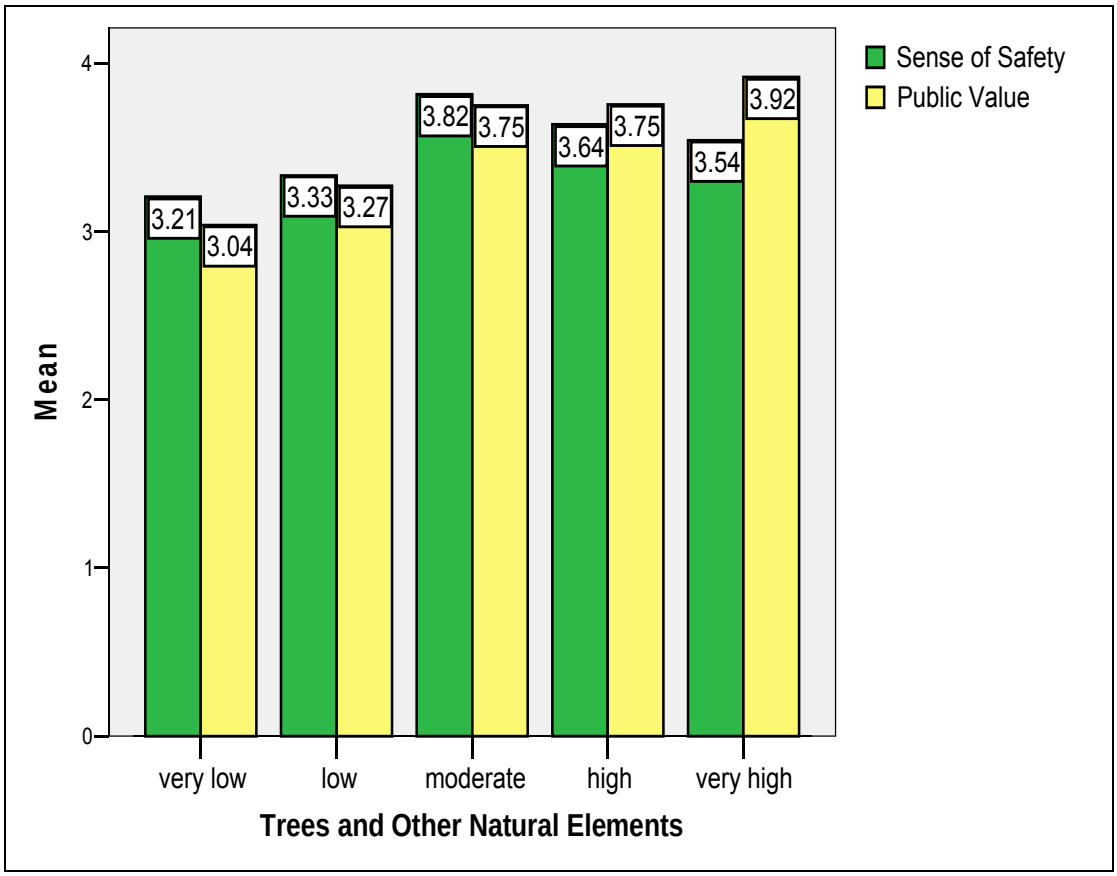

Figure 3.9. Mean Sense of Safety and Public Value Ratings for Five Levels of the Tree-Nature Category.

In sum, trees and other natural features elicited positive impression responses. Respondents' impression was the most positive for the highest level of prominence in the community garden scenes.

Built-identity category

Built features that convey community identity (built-identity) have a similar relationship with sense of safety to the tree-nature category; the moderate levels receiving the highest safety ratings (Figure 3.10). Among gardens which have built-identity features, those with high levels received the lowest safety ratings (M=3.22).

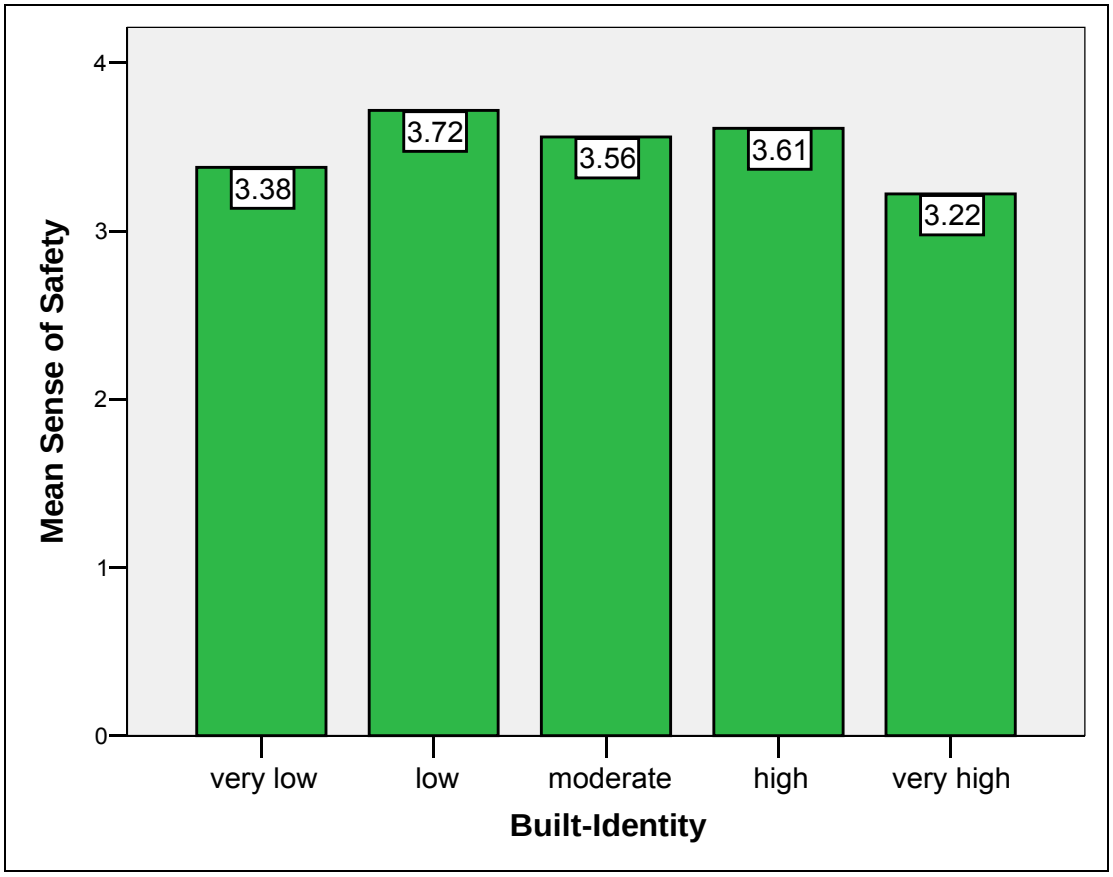

Figure 3.10. Mean Sense of Safety Ratings for Five Levels of the Built-Identity Category.

Built-Social category

In general; the relationship between built features that facilitate social activities (built-social) and preference is negative; as these built-social features increase, preference decreases (Figure 3.11).

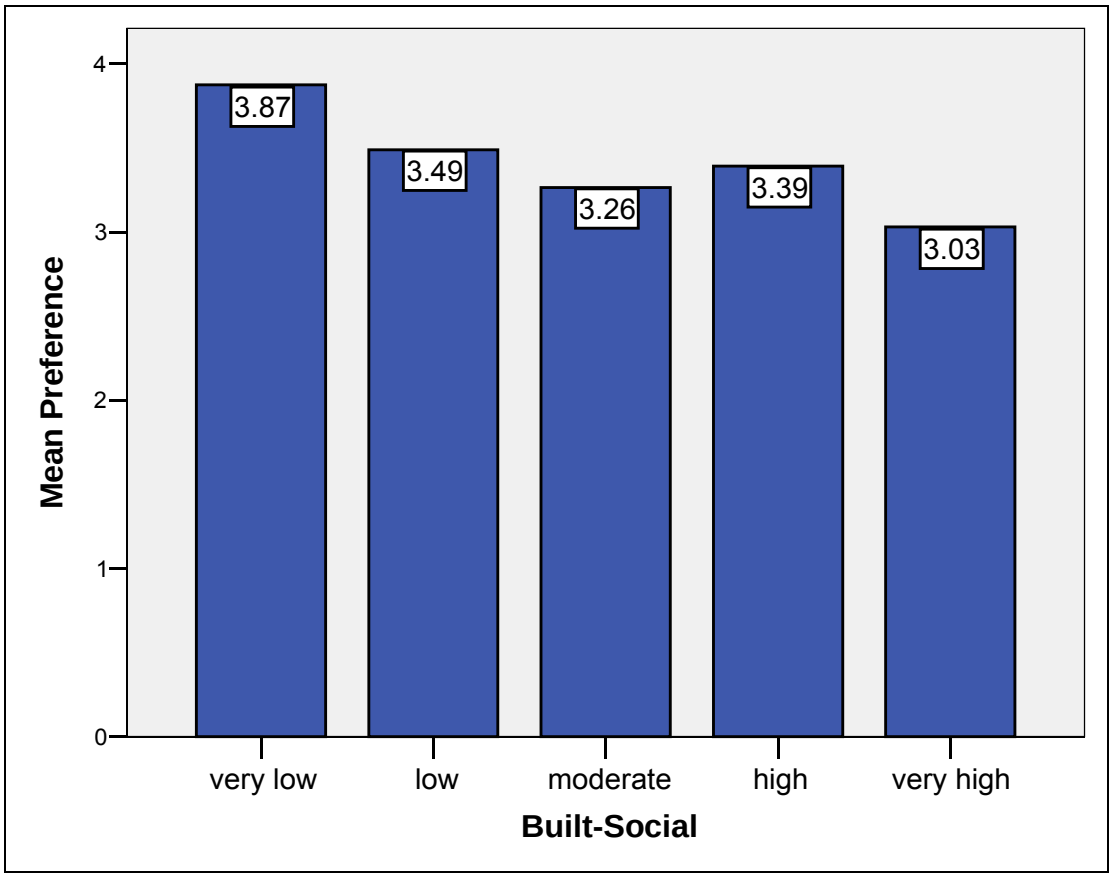

Figure 3.11. Mean Preference Ratings for Five Levels of the Built-Social Category.

Cultural Category

The cultural category (combined Identity and social features) had the most significant effect of the four combined feature categories, especially on preference (β=-0.66, p<0.005). Cultural features are associated with very

similar preference ratings as built-social features with a mean rating for “very low” between 3.87 and 3.91, and a rating for “very high” of 3.03 for both categories (Figure 3.12).

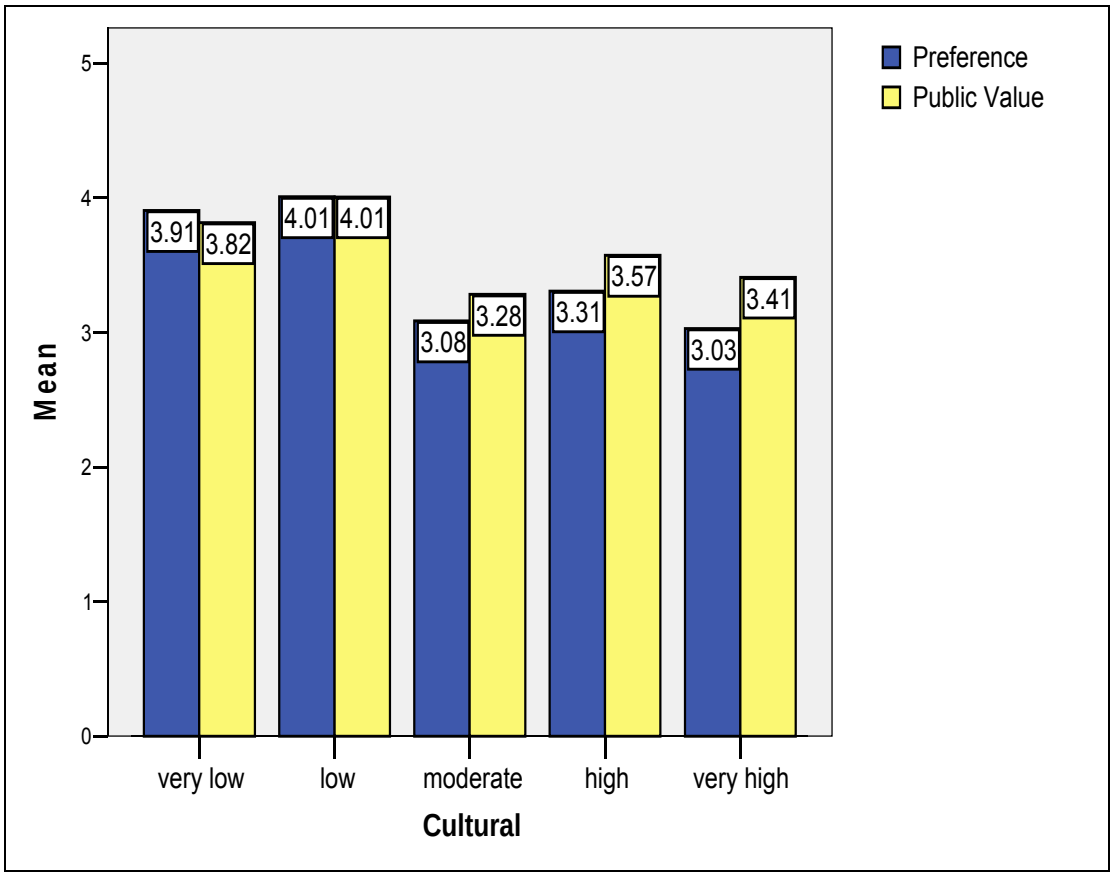

Figure 3.12. Mean Preference and Public Value Ratings for Five Levels of the Cultural Category.

Aim 1c: How do community garden setting types affect impression?

In this section, I will examine the association between garden settings and the impression variables. The K-means clustering method of analysis was conducted in order to group the photos into garden setting typologies. Cluster analysis of physical features in the photos yielded four settings. ANOVA shows that for the eight different variables, with the exception of paths, there is

a difference among the means on the four clusters. In other words, the four clusters are significantly different from one another.

Garden setting types: Identification

The four Garden Setting Types are: (1) Formal, Built, Open; (2) Informal, Dense Natural; (3) Informal, Natural, Cultural; and (4) Informal, Built, Cultural (Figures 3.13, 3.14, 3.15, and 3.16). These typologies were derived from cluster analysis of physical feature prominence-ratings[27].

Formal, Built, Open. Setting type 1 is the most formal style (4.40) of all the clusters, with the highest prominence of paths (5.25) and open views (4.78) among the four settings. A moderately high level of natural features (tree-nature = 4.40) are present. Next to paths, built features are the second highest prominent feature in these gardens (4.91).

Figure 3.13. Example of Formal, Built, Open Garden Setting Type.

[27] Prominence-ratings are the average ratings given by judges for the various features in each photograph; i.e. how prominent each feature appeared in the photo.

Informal, Dense Natural. Setting type 2 is the group of gardens with a high prominence of natural features (tree-nature = 6.35); paths are moderately prominent (4.53). Style was rated 3.01, which is on the more informal side of the spectrum. This setting is rated the lowest for open views (3.16), and also lowest for the amount of built-identity (1.75) and built-social (2.35) features among the four settings.

Figure 3.14. Example of Informal, Dense Natural Garden Setting Type.

Informal, Natural, Cultural. Setting 3 is the most informal style (2.73) with a moderately high level of natural features (tree-nature = 4.40), as well as having highly prominent built-identity (5.80), built-social (5.85) features. This setting has the highest ratings for cultural (5.95) features.

Figure 3.15. Example of Informal, Natural, Cultural Garden Setting Type.

Informal, Built, Cultural. Setting 4 has the lowest natural features (1.90) of any of the clusters. The style is quite informal (3.01), and has the most built features (6.00), with the highest built-identity (6.75) features and high built-social (5.10) features. This setting was rated quite high for cultural (5.36) features.

Figure 3.16. Example of Informal, Built, Cultural Garden Setting Type.

Effect of clustering

After controlling for the individual respondents and photos, an estimate of fixed effects shows that there is a significant effect of clustering. In other

words, the cluster to which each photo belongs, seems to have an effect on the response in terms of the tree components of impression.

Garden setting scores

To consider the relation between garden settings and the impression dependent variables, analyses were based on garden setting scores (i.e., the mean score for each garden setting based on all participants who completed the rating task). As shown in Table 3.3 and Figure 3.17, the Formal, Built, Open Setting received the highest setting score for sense of safety and public value, and the highest overall setting score for the average of the three dependent variables (3.89). The impression factor came out the highest as well (0.28[28]). In terms of preference, the Informal, Dense Natural Setting received the highest setting score (3.86), however; this setting received the lowest score among the four settings for sense of safety (3.42). The Informal, Natural, Cultural Setting received relatively average scores across the board. The Informal, Built, Cultural setting received the lowest overall setting scores; lowest for preference (3.06), lowest for public value (3.37), lowest average of the three (3.30), and the lowest impression factor (-0.30).

Table 3.3. Mean Scores for Garden Setting Types (Standard Deviation).

Garden Setting	Impression Factor	Preference	Sense of Safety	Public Value
(1) Formal, Built, Open	0.28(0.93)	3.81 (1.14)	3.92 (0.93)	3.93(1.09)

[28] Factor analysis yields a continuous measure from -1 to 1; normalized around 0. The closer to -1, the more negative the impression response and the closer to 1, the more positive the impression.

Table 3.3 (Continued).

(2) Informal, Dense Natural	0.07 (0.93)	3.86 (1.04)	3.42(1.05)	3.78 (1.08)
(3) Informal, Natural, Cultural	-0.10 (0.99)	3.35 (1.16)	3.57 (1.04)	3.59 (1.17)
(4) Informal, Built, Cultural	-0.30 (-0.01)	3.06 (1.25)	3.46 (1.07)	3.37 (1.24)

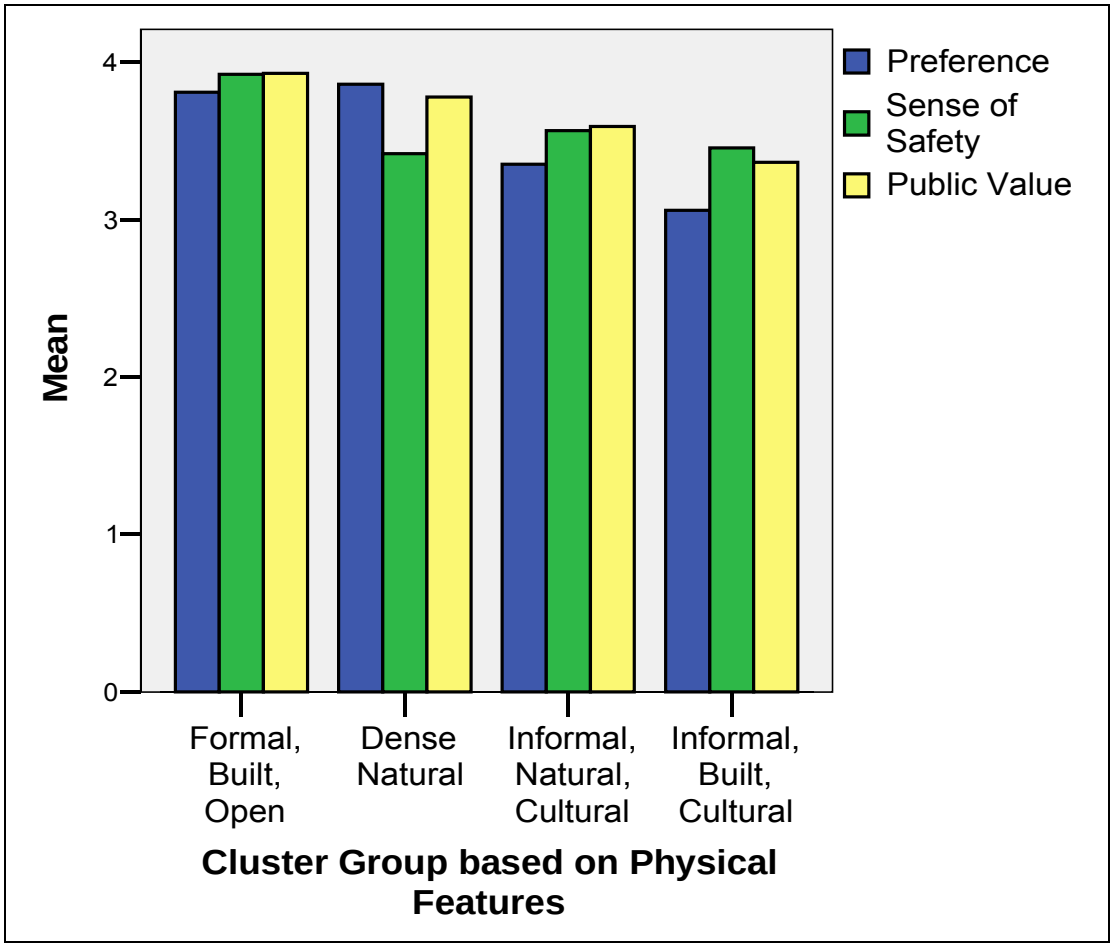

Figure 3.17. Mean Preference, Sense of Safety and Public Value Ratings for Garden Setting Types.

AIM 2 - MAIN EFFECTS OF OTHER VARIABLES ON IMPRESSION OF COMMUNITY GARDENS

The results for Aim 2 will be organized in two parts. First, I will look at main effects of expertise type (laypeople, planners, and community gardeners) on the three components of impression (preference, sense of safety, and public value) for all community gardens. Second, I examine the main effects of demographic variables included in the study (e.g. gender, income, race, etc.)

Aim2a: How Does Expertise Affect Impression of Community Gardens?

Linear regression analysis was used to examine main effects of expertise on impression. If an effect was detected, then independent-samples t-tests were conducted to compare impression responses between groups (i.e., three comparisons for each dependent variable: (1) laypeople and planners; (2) laypeople and community gardeners; and (3) planners and community gardeners). Table 3.4 and Figure 3.18 show the differences in mean ratings for each expert group and each dependent variable.

Table 3.4. Expert's Mean Ratings of Community Gardens (Standard Deviation)

	Dependent Variables		
	Preference	Safety	Value
Layperson	3.26 (1.17)	3.32 (1.02)	3.40 (1.11)
Planner	3.23 (1.19)	3.43 (1.01)	3.47 (1.15)
Community Gardener	3.73 (1.14)	3.79 (0.97)	3.90 (1.09)

With respect to preference, expertise had a significant effect ($F(2)=50.00$, $p=0.000$). There was not a significant difference in the scores between laypeople ($M=3.26$, $sd=1.17$) and planners (($M=3.23$, $sd=1.19$); $t(2248)=0.59$, $p=0.556$). However; there was a significant difference between laypeople and community gardeners (($M=3.73$, $sd=1.14$); $t(5818)=14.00$, $p=0.000$) as well as between planners and community gardeners ($t(5008)=-11.03$, $p=0.000$). These results suggest that community gardeners tend to like community gardens significantly more than both laypeople and planners.

For safety, expertise had a significant effect ($F(2)=63.00$, $p= 0.000$). There was a significant difference in the scores between laypeople ($M=3.32$, $sd=1.02$) and planners ($M=3.43$, $sd=1.01$); $t(2248)=-2.36$, $p=0.019$) as well as between laypeople and community gardeners (($M=3.79$, $sd=0.97$); $t(5818)=15.99$, $p=0.000$). There was also was a significant difference between planners and community gardeners ($t(5008)=9.18$, $p=0.000$). These results suggest that in terms of safety; there are definite differences in experts' impression of community gardens, with community gardeners again rating gardens highest.

In terms of public value, expertise had a significant effect ($F(2)=60.15$, $p=0.000$). There was not a significant difference in the scores between laypeople ($M=3.40$, $sd=1.12$) and planners ($M=3.47$, $sd=1.15$); $t(2248)=-1.43$, $p=0.154$). However; there was a significant difference between laypeople and community gardeners (($M=3.90$, $sd=1.09$); $t(5818)=15.22$, $p=0.000$) as well as between planners and community gardeners ($t(5008)=9.57$, $p=0.000$). These results suggest that community gardeners have a significantly different perspective on public value of community gardens than both laypeople and planners.

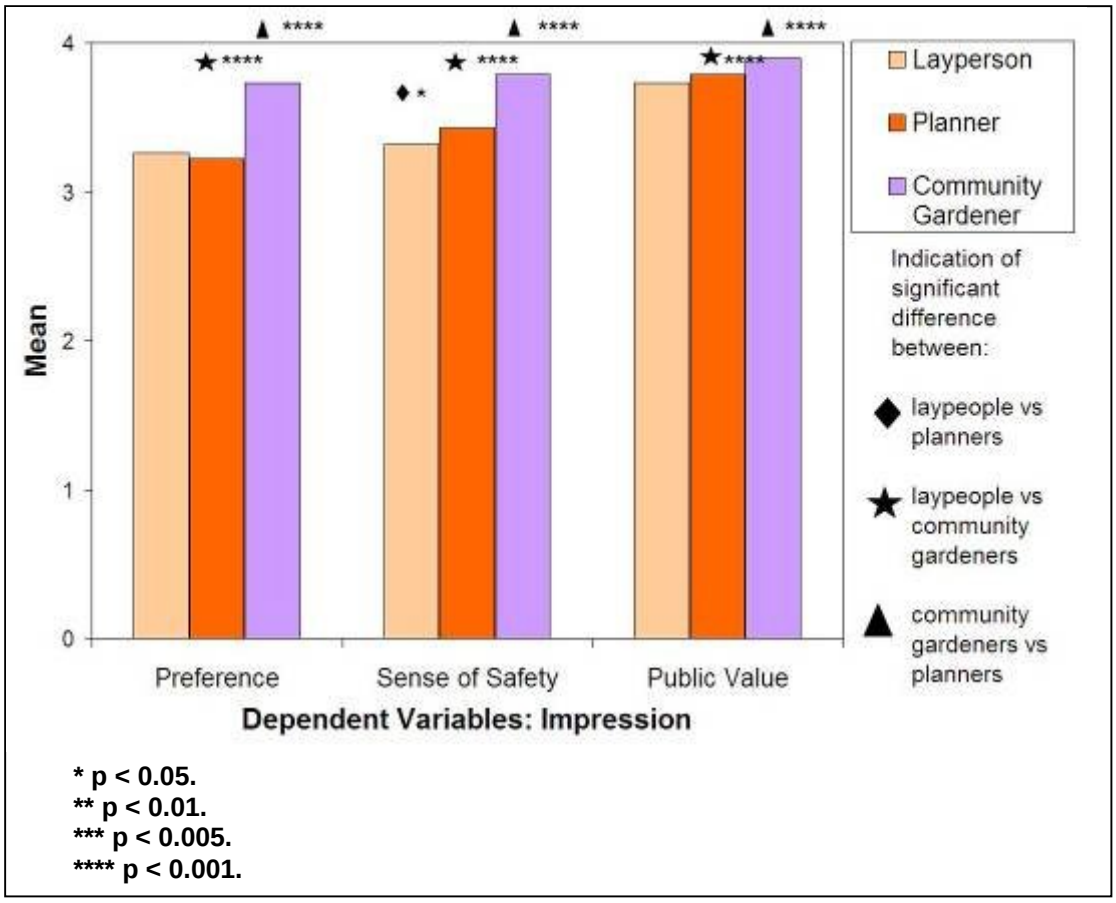

Figure 3.18. Mean Impression Rating Differences Among Expert Groups.

In sum, laypeople and planners are quite similar in their ratings, while community gardeners are different across the three components of impression. Overall, community gardeners appear to have a more positive impression of gardens than both laypeople and planners.

Aim 2b: How Do Other Variables Affect Impression of Community Gardens?

Hierarchical linear modeling was used to examine the main effects of demographic variables on impression. Only gender and income were found to have a significant relationship with impression of community gardens (Table 3.5).

Table 3.5. Results from HLM Using Demographic Information to Predict Impression and Three Components of Impression.

		Impression	Preference	Safety	Value
Demographics	Intercept	0.45	3.79	4.27	4.11
	Standard Error	0.49	0.50	0.51	0.59
	Age *β*	-0.02	0.01	-0.02	-0.04
	Standard Error	0.03	0.03	0.03	0.04
	Gender *β*	0.16	0.20*	0.06	0.24*
	Standard Error	0.08	0.09	0.09	0.10
	Ethnicity *β*	-0.17	-0.17	-0.26	-0.08
	Standard Error	0.20	0.21	0.21	0.25
	Race *β*	0.02	-0.01	0.03	0.01
	Standard Error	0.03	0.03	0.03	0.04
	Education	-0.02	-0.00	0.01	-0.06
	Standard Error	0.05	0.05	0.05	0.06
	Income *β*	-0.05**	-0.05*	-0.06***	-0.04*
	Standard Error	0.02	0.02	0.01	0.02
	Urban Type[29] *β*	0.09	0.07	0.07	0.09
	Standard Error	0.03	0.02	0.02	0.02

*** p < 0.05.**
**** p < 0.01.**
***** p < 0.005.**
****** p < 0.001.**

[29] Urban type represents differences between respondents living in rural, suburban, or urban areas.

Main Effects of Gender

As shown in Figure 3.19, on average, women rated gardens higher than men for preference (women M=3.57; men M=3.38, $p<0.05$) and for public value women M=3.72; men M=3.50, $p<0.05$). The relation with safety was not found to be significant (Table 3.5). It appears that in general women like community gardens more than men do, and find them to be more valuable.

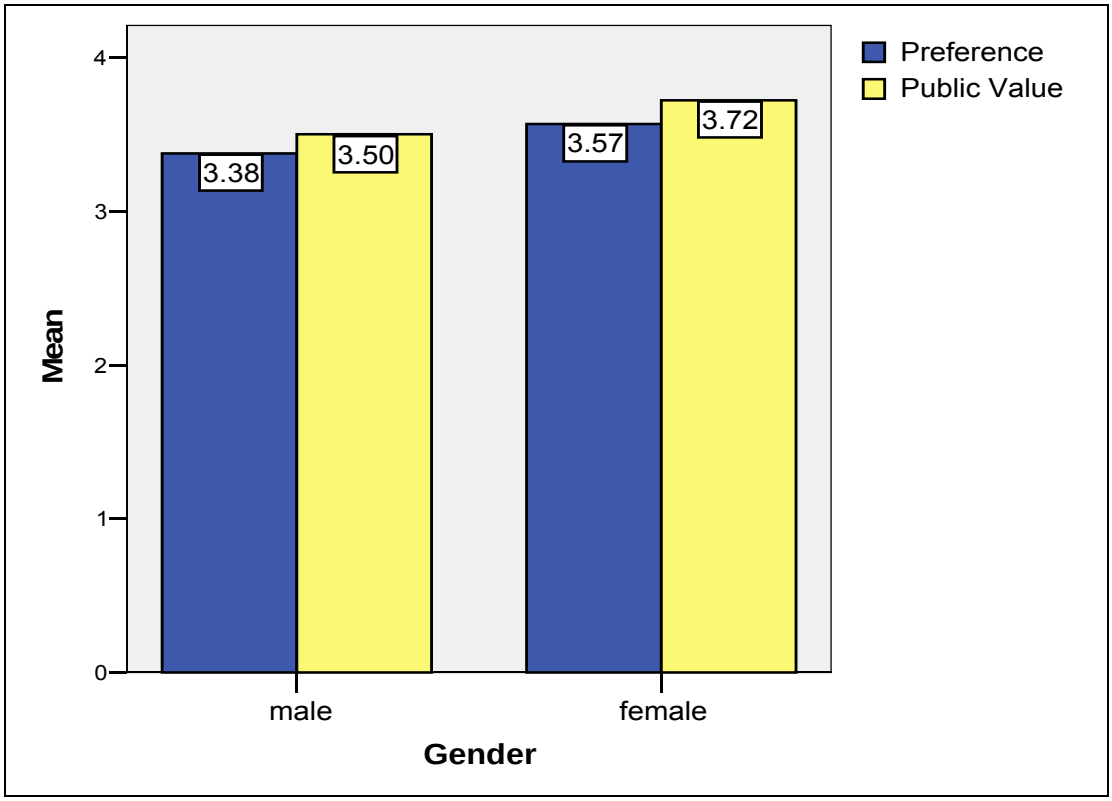

Figure 3.19. Mean Ratings for Preference and Public Value for Male and Female Respondents.

Main Effects of Income

The relationship between income and impression was significant for preference, safety, and public value. The highest significance level was for safety ($p<0.005$) (Table 3,5). It is interesting to see that respondents with the

lowest annual household income (<$9,999) gave the gardens the lowest ratings on average (M=3.21) and those with the highest annual income (>$100,000) gave the next lowest rating (M=3.53).

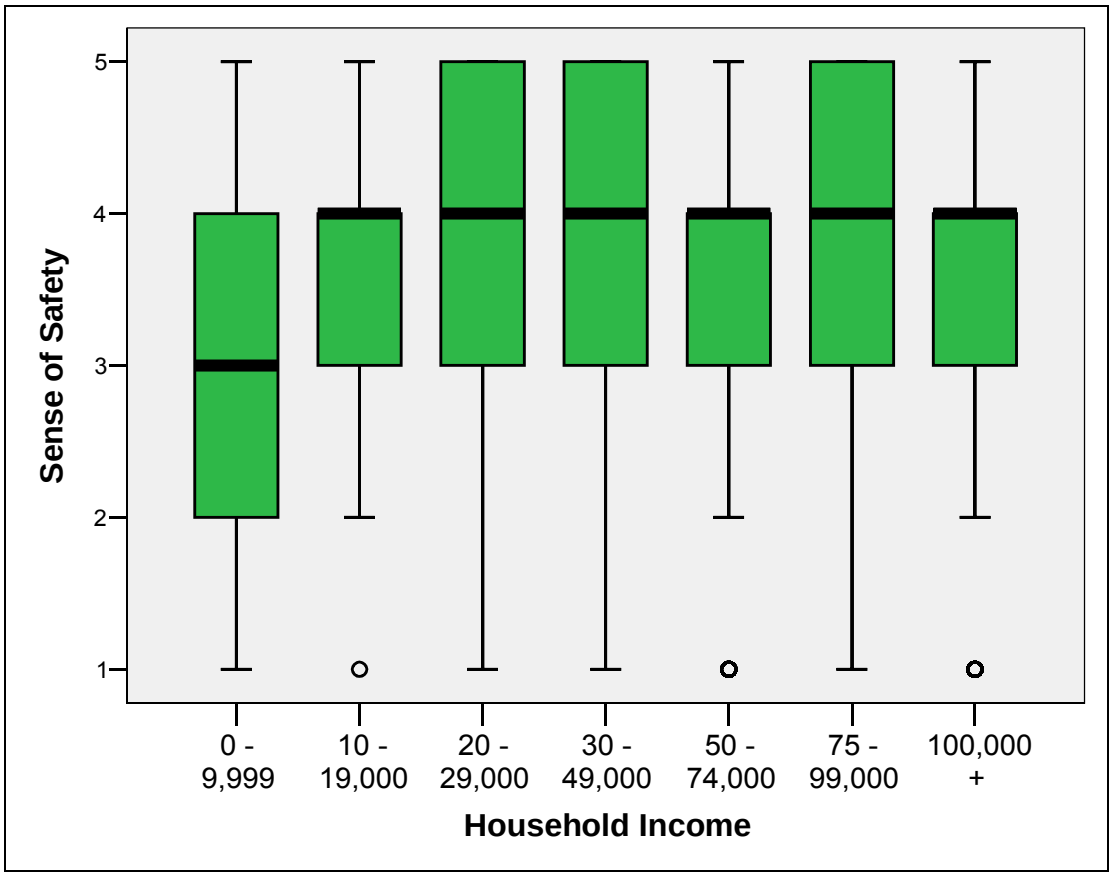

Figure 3.20. Box Plot Showing Mean Safety Ratings for Respondents Based on Income.

As the boxplot in Figure 3.20 shows, the middle 50% of respondents who reported their annual household income as less than $9,999 had the lowest spread of safety ratings of all groups. Additionally, the median rating for this low income group (shown by the thick horizontal bar) was lower than the other groups.

AIM 3 – HOW DOES EXPERTISE AFFECT THE RELATION BETWEEN COMMUNITY GARDEN FEATURES AND IMPRESSION?

I will address Aim 3 by looking at how the effect of physical features on impression might depend on the respondent's expertise. I will use regression analysis to examine the interaction of expertise (laypeople, planners, and community gardeners) and physical feature categories[30]: trees and other natural features; and maintenance style[31].

More than a third of the total variability (R^2=40.6%) in impression is explained by individual respondent variable (respondent ID). Therefore; analysis of how the differences among these groups might change the effects of physical features on impression should provide a more complete understanding of the data.

Interaction of Expertise & Trees and Other Natural Features

As was discussed in the Aim 1 section, the trees and other natural features category had a significant main effect on safety, but not on preference or public value. However; there are significant interaction effects of the tree nature variable and expertise on preference (F(3, 10949)=522.43, p=0.00) and on public value (F(3, 10949)=247.09, p=0.04), but not on safety (Table 3.6). This indicates that with respect to safety, all groups have a similar response to different levels of trees and other natural features in a community garden

[30] Other features were examined for possible interactions with expertise; however; only the significant interaction effects ($p<0.05$) on the impression variables were included in the results.
[31] Both main effects of physical features and expertise were included in the models in Aim 3 interaction analyses.

scene but that the effect of tree nature on preference and public value differs by group.

Table 3.6. Results from Regression Analysis Using Expertise & the Tree-Nature Category to Predict Impression.

		B	R^2	F	df	SE	p
Preference	Main effect Tree Nature	0.31	0.10	1200.73	1, 10949	0.01	0.00
	Main effect Expert	-0.16	0.03	288.11	1, 10949	0.01	0.00
	Interaction Tree Nature * Expert	0.11	0.13	522.43	3, 10949	0.00	0.00
Sense of Safety	Main effect Tree Nature	0.05	0.00	32.37	1, 10949	0.01	0.00
	Main effect Expert	-0.18	0.03	351.35	1, 10949	0.00	0.00
	Interaction Tree Nature * Expert	0.04	0.03	129.02	3, 10949	0.00	0.26
Public Value	Main effect Tree Nature	0.19	0.04	415.89	1, 10949	0.01	0.00
	Main effect Expert	-0.16	0.03	297.58	1, 10949	0.01	0.00
	Interaction Tree Nature * Expert	0.08	0.06	247.09	3, 10949	0.00	0.04

For community gardeners, trees and other natural features had a modest influence on preference, however; for planners and laypeople the influence was stronger. The pattern was similar for public value; the influence of tree-nature on public value was stronger for planners and laypeople than for community gardeners. The difference in influence of this feature was weaker for public value than for preference for both groups. Additionally; the difference in both preference and public value ratings between community gardeners and the two other groups is particularly pronounced when tree-nature is low (for preference: laypeople M=2.47, planners M=2.42, and community gardeners M=3.62; for public value: laypeople M=2.92, planners M=2.79, and community gardeners M=3.62). The interaction effects are illustrated in Figures 3.21 and 3.22.

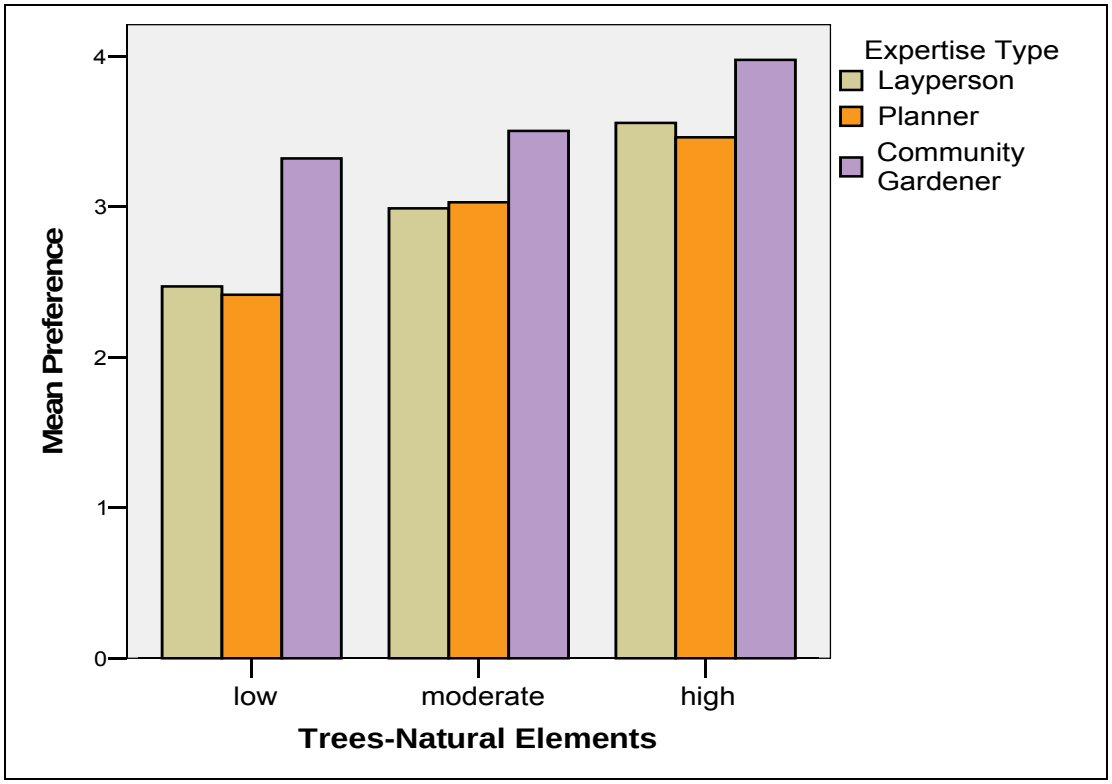

Figure 3.21. Mean Preference Ratings for Three Levels of Tree-Nature Category.

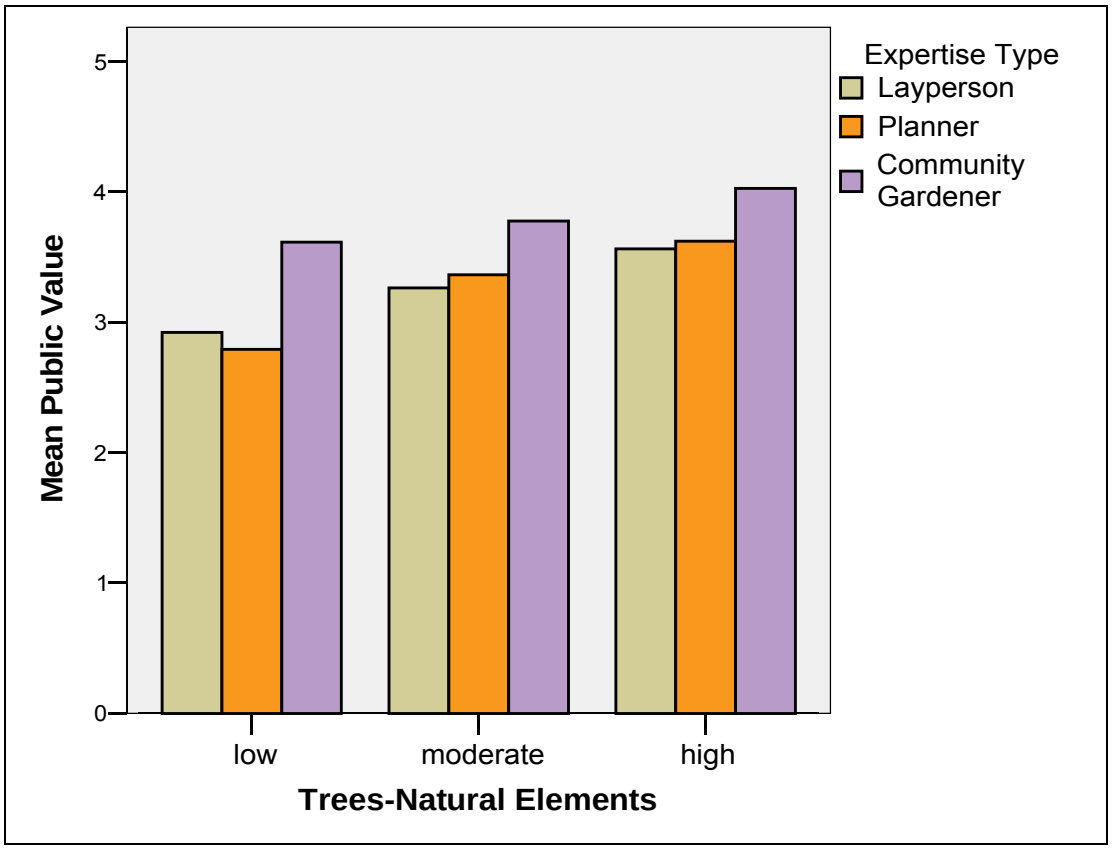

Figure 3.22. Mean Public Value Ratings for Three Levels of Tree-Nature Category.

Interaction of Expertise & Maintenance Style

Significant interaction effects of maintenance style and expertise were found for preference ($F(3,10949)=405.40$, $p=0.00$), safety ($F(3,10949)=346.43$, $p=0.00$), and public value ($F(3,10949)=295.51$, $p=0.00$) (Table 3.7). As illustrated in Figures 3.23, 3.24, and 3.25, the link between garden style and impression is stronger for laypeople and planners than for community gardeners.

Table 3.7. Results from Regression Analysis Using Expertise & Style to Predict Impression.

		B	R^2	F	df	SE	p
Preference	Main effect Style	0.27	0.07	851.79	1, 10949	0.01	0.00
	Main effect Expert	-0.16	0.03	288.11	1, 10949	0.01	0.00
	Interaction Style* Expert	0.18	0.10	405.40	3, 10949	0.01	0.00
Safety	Main effect Style	0.24	0.06	674.78	1, 10949	0.01	0.00
	Main effect Expert	-0.18	.03	351.35	1, 10949	0.00	0.00
	Interaction Style* Expert	0.16	0.09	346.43	3, 10949	0.00	0.00
Public Value	Main effect Style	0.22	0.05	546.47	1, 10949	0.01	0.00
	Main effect Expert	-0.16	0.03	297.58	1, 10949	0.01	0.00
	Interaction Style* Expert	0.12	0.08	295.51	3, 10949	0.01	0.00

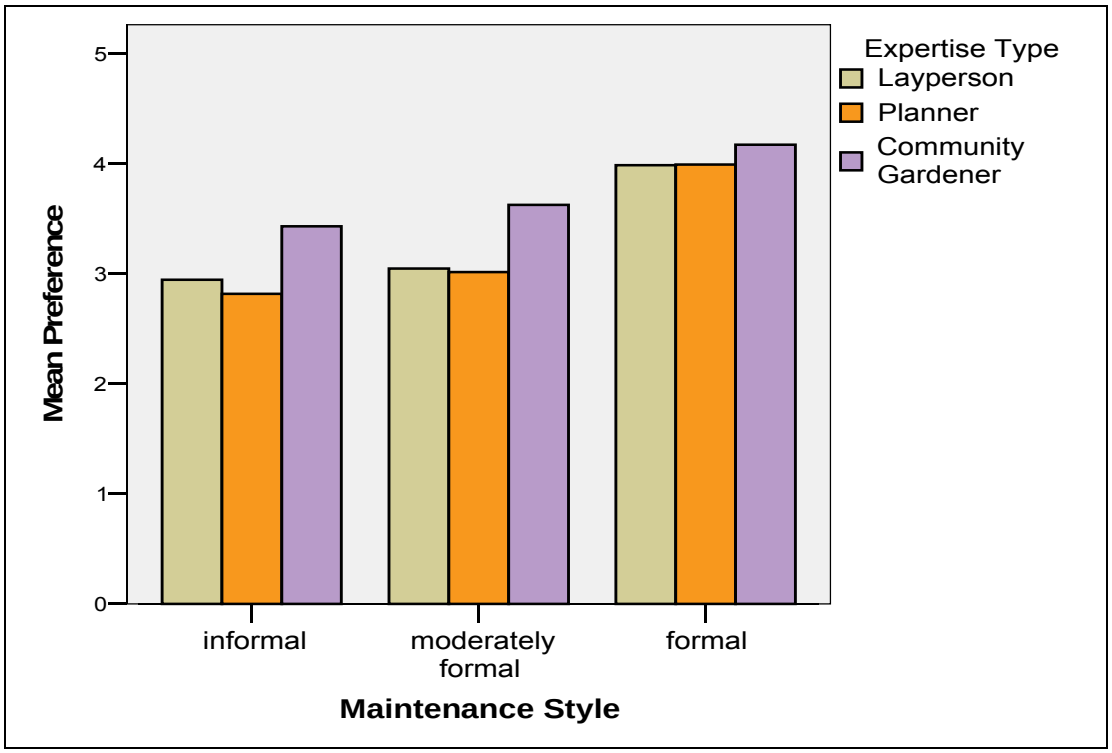

Figure 3.23. Mean Preference Ratings for Different Types of Style.

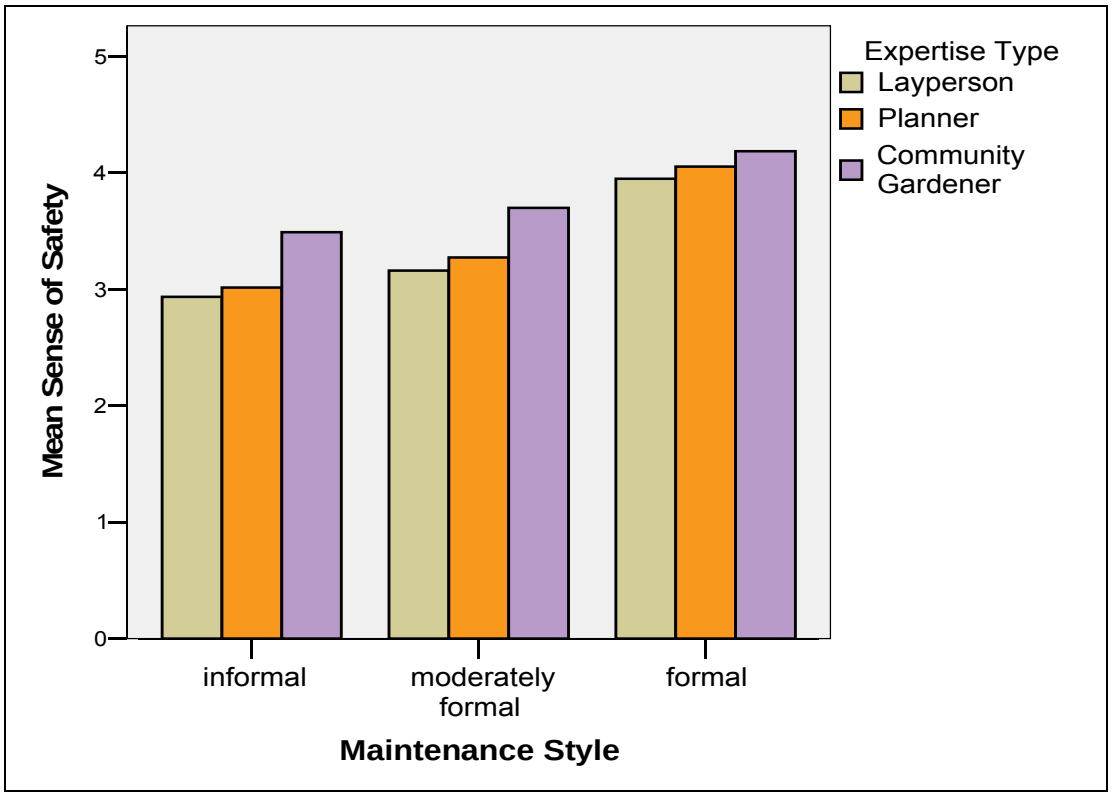

Figure 3.24. Mean Sense of Safety Ratings for Different Types of Style.

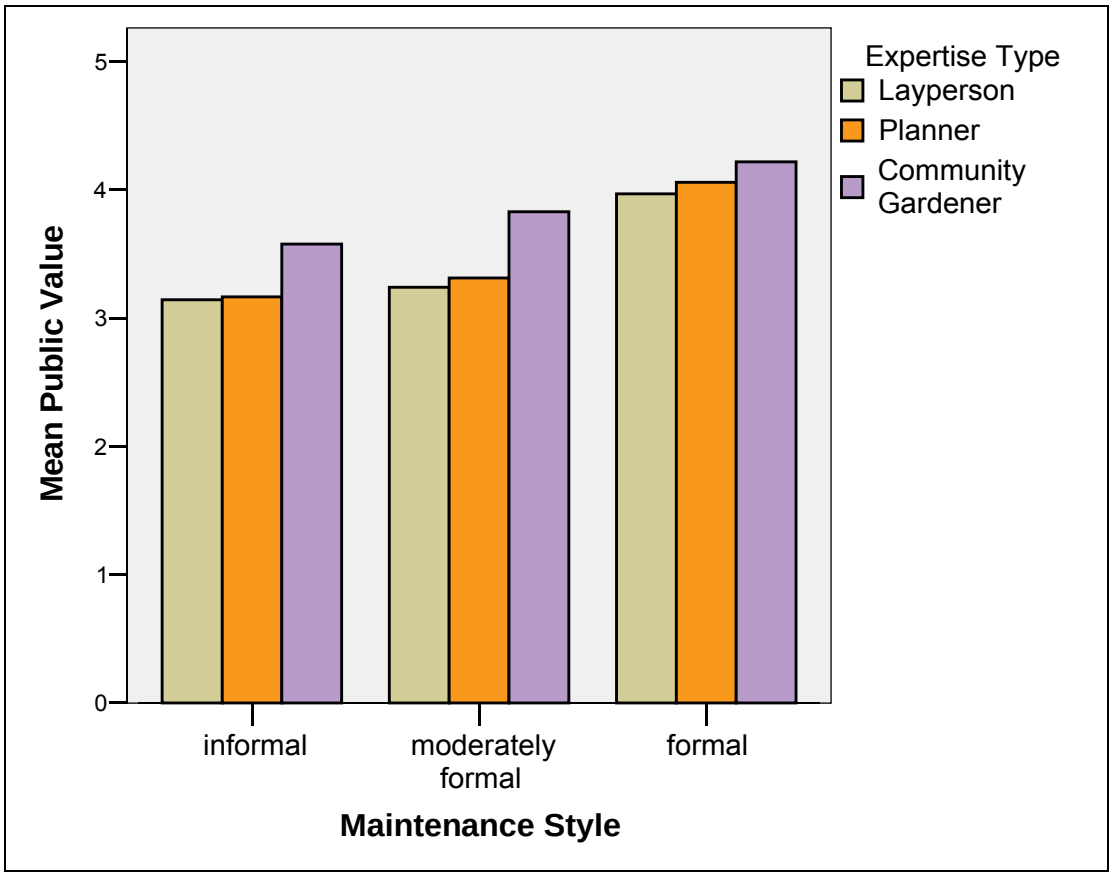

Figure 3.25. Mean Public Value Ratings for Different Types of Style (Informal to Formal).

Informal garden style had a more negative influence on preference, safety, and public value ratings for laypeople and planners than for community gardeners. Figures 3.23, 3.24, and 3.25 also illustrate that the differences among groups' impression is much less pronounced for more informal gardens. This indicates that while formal gardens seem to influence impression similarly for all groups, informal gardens give a more positive impression to community gardeners than laypersons and planners.

CHAPTER 4

Discussion

INTRO TO DISCUSSION

In this chapter I will first revisit the study results and reflect on the implications. Secondly, I will acknowledge the limitations of this study. Finally; I will suggest directions for future research.

SUMMARY OF RESULTS

The discussion of results will include first a general overview of interesting findings for all community gardens. Then, the specific points of interest will be covered, organized by three physical feature categories which had consistent significant influence on impression: (1) trees and other natural features; and (2) maintenance style. Noteworthy results of both main effects and interactions with expertise will be discussed under each feature subheading.

General Points of Interest for All Community Gardens

Dependent variables

A brief descriptive analysis of dependent variables shows that public value received the highest average rating (M=3.67, sd=1.16) for all community gardens (preference, M=3.53, sd=1.20; safety, M=3.60, sd=1.04). It appears that in general, people attribute public value of community gardens to a higher degree than they like them or think they would feel safe there.

Experts

The results of this study showed that impression of community garden features depends on expertise. In general, community gardeners seem to be less affected than other groups by changes in levels of physical features, and their ratings were consistently higher than both laypeople and planners. Additionally, standard deviations for mean ratings were lower among community gardeners; indicating less variability, or more agreement, within that group.

There are a myriad of factors that may contribute to this difference among groups. One possible explanation is familiarity (Devlin & Nasar, 1989; Francis, 1987; Kaplan & Herbert, 1987; Talbot & Kaplan, 1986; Wilkie & Roach, 2004). Community gardeners are likely to have spent more time in the gardens than laypeople or planners, and so they may be less affected (in terms of their impression) by the differences in features. They may also be less negative because of their understanding of reasons for differences in levels of garden features.

Additionally, there may be beliefs and biases of community gardeners rooted in their personal investment in the gardens. Although it is not possible to tell what percentage of community gardeners in this study sample are ACGA members, it it likely to be high, as the ACGA listserv was the first point of contact in the snowball sampling. It is possible that community gardeners, especially those invested in the ACGA mission, rated some of these gardens less critically than other groups because of concerns about how the results could affect the community gardening movement.

Gender

In past studies examining how natural urban environments are perceived, the issue of safety, especially for women, has been at the forefront (Day, 1994; Schmelzkopf, 1995). Among the demographic variables included in the study, perhaps the most surprising result was that there was not a significant main effect of gender on sense of safety. In fact, women's average rating was slightly higher (although not significantly) (M=3.62), than men's (M=3.56).

Specific Features and Impression

Trees and other natural features

Consistent with past studies (Herzog, Kaplan, and Kaplan, 1982; Kaplan, 1985; Kuo, Sullivan, Coley, & Brunson, 1998; Ulrich, 1986; Wolf, 2004), trees and other natural features received positive ratings for preference and public value, especially at a moderate level compared to a low level. However; if we look at expertise (laypeople, community gardeners and planners) as an interaction variable, when trees and other natural features are low, it is clear that community gardeners are less affected by the differences in levels than laypeople and planners. Perhaps community gardeners see any level of trees and other natural features as a good thing.

Despite popular belief about how trees and other natural features can decrease sense of safety (Kuo, Bacaicoa, & Sullivan, 1998; Schroeder & Anderson, 1984), the findings of this study support those of Kuo, et al. (1998), which showed that inner-city residents rated higher tree-density with a higher sense of safety. The current findings indicate that a low to moderate level of

trees were rated high for safety (M=3.81) and a high level of trees was still rated quite high (M=3.71). However, in contrast to the Kuo et al. (1998) findings, that the opinions of housing authority administrators and police differed from those of residents, in this study sense of safety was similar across groups (no interaction was found between expertise and the tree-nature variable for safety).

Maintenance style

In the variety of ways features were examined in this study (independently, as combined categories, and in garden setting types), maintenance style had the most consistently significant influence on impression.

As an individual feature, style was a significant predictor of preference, sense of safety, and public value. Consistent with previous research, more formal landscapes were found to be preferred to more informal landscapes (Kaplan & Austin, 2004), and higher formality was also associated with higher safety ratings (Kuo, Bacaicoa, & Sullivan, 1998; Schroeder & Anderson, 1984).

Regarding setting types, formality appears to play a significant role in impression responses. Built features were prominent in both the most and least preferred setting types, but the most preferred setting (Formal, Built, Open) is quite formal, while the least preferred type (Informal, Built, Cultural), is quite informal. Safety was also rated highest in the Formal, Built, Open setting, showing that built features do not seem to be associated with low sense of safety, perhaps because formality, as well as open views, are also prominent.

When looking at the interaction between experts and style, impression was significantly different among experts for preference, safety, and public value. The relation was stronger for laypeople and planners than it was for community gardeners. Community gardeners seem to have less of a differing opinion than other groups when it comes to differences in style.

IMPLICATIONS

The results have implications for all community garden stakeholders who hope to preserve and initiate further gardens in the fabric of the urban environment. As Rachel Kaplan warns, "if designers and the public are to work together to some degree on design decisions, a mutual recognition of these differences is essential" (Kaplan & Kaplan, 1989, p. 249). Differences in opinion must be recognized, but not seen as insurmountable challenges. Community gardeners must realize that public support is essential to the survival of their gardens, and so they must work together with the public to understand differences in opinion, and improve understanding.

Perhaps even more crucial than recognizing differences in opinion is the pursuit of similar viewpoints. As the results of this study show, community gardeners appreciate many of the same features as urban planners and laypeople. Design interventions that can be agreed upon will greatly improve the likelihood of general public support.

Implications for Design

Visibility of benefits

A community garden may be a valuable commodity in multiple respects, however; if the garden is an eyesore, or deemed as such, then the community garden will certainly lose out against other competing land-uses. Intentional design derived from empirical studies such as this one, participatory planning, and city-nonprofit-community partnerships can help to make the benefits and value to the community undeniably apparent.

In order to increase support, the public has to know what the benefits are, and so they must be made visible. When support is at stake, it is important to consider how passers-by might make sense of the physical characteristics of the garden, and what information they might associate the physical characteristics with. Lawson (2005) explains that "[b]ecause gardens are a physical presence in the city, the way they appear to the general public influences perceptions of how they serve their community. Gardeners should be concerned with how their gardens look from the street as well as how inviting the project seems to newcomers" (Lawson, 2005, p. 300).

Openness of View

A concern of some landscape designers is that the removal of trees and other natural features in order to improve visibility and increase open views may affect the scenic quality, and therefore preference (Schroeder & Anderson, 1984). In a study by Schroeder and Anderson (1984), open areas with only a few trees were perceived as the safest of the 17 urban recreation sites examined, but the lack of trees were seen as an aesthetic liability.

Results of this study confirmed the general theory that a low to moderate level of trees and other natural features (Figure 3.9), as well as more open views (Figure 3.8), are associated with a higher sense of safety (Jorgensen, Hitchmough, & Calvert, 2002; Kuo & Sullivan, 2001; Newman, 1972). However; overall impression was not compromised; a moderate level of trees and other natural features was associated with an average rating of 3.82 for public value (Figure 3.9.) If garden views are limited or blocked, the cost to benefits ratio of modifying this should be quite worth it for both perceived and actual safety for gardeners, as well as public impression of value.

Maintenance style

Community gardeners are the "designers" of community gardens, and they tend to go with a more informal aesthetic. Perhaps ironically, as results in this study show, community gardeners prefer more formal gardens, feel that they appear safer, and attribute more public value to them. Given this agreement among community gardeners, planners, and laypeople, it seems a compromise could be reached. With careful planning, even the most formal garden can host ecological biodiversity.

Implications summary

The applicability of these complex and sometimes contradictory results may seem dubious. However; if gardeners prioritize the changes that are feasible, and those that elicit the most consensus from members of the garden and surrounding community, success is certain.

Community gardens that are both sustainable and aesthetically pleasing can be created. This opportunity is possible via two approaches: (1)

public dissemination of information about what a sustainable landscape looks like and what the benefits are; and (2) efforts to design community gardens in a way that pays tribute to some traditionally accepted aesthetics, especially formality.

LIMITATIONS OF THIS STUDY

Skewed Demographic Makeup of Respondents

A major limitation of this study was demographic makeup of respondents. The composition of community gardeners in the United States is quite diverse racially, ethnically, and in terms of economic status (Saldivar-Tanaka & Krasny, 2004; Shinew, Glover, & Parry, 2004). Unfortunately, due to sampling challenges, this important factor was overlooked, and the composition of this study sample was quite homogenous (white, upper-class, highly educated females).

Impression of certain features, especially those designed to reflect culturally significant aesthetics, could be highly dependent on background. Efforts should be made in future studies to include respondents from a range of backgrounds. This is especially important when features based in cultural vernacular, which are so prevalent in community gardens, are being examined.

External Validity

While the community gardening movement in New York City is perhaps the most well-known, it is by no means the only place these gardens exist. Just as aesthetic styles change from garden to garden in this study, there are

massive differences among gardens across the United States, and even around the world. Future studies should consider inclusion of various garden designs in order to further explore what elicits positive public impression.

Photographs as Proxy to Experience of a Place

Photograph surveys have been found to be a highly effective instrument for studying environmental perception (Kaplan, 1985), however; it is important to keep in mind how results might differ if respondents were given the chance to be *in* the community garden. Unfortunately, due to limitations in time and resources, it was not possible to see how respondents would have reacted to community gardens while standing in them. This would be an interesting comparison in future research.

FUTURE RESEARCH

This study did not address several factors that may also influence impression of community gardens. Areas of suggested future research are outlined below. In general, I would suggest that participatory action research be implemented if at all possible, as the perspective of community gardeners on the issues and study design would be quite valuable.

View of Garden: Fences and Entrance Gates

While photographs in this study captured views from the entrances, it would be quite interesting to look at how the appearance of the entrance gate and/or fence affect impression. As Lawson (2005, p. 300) points out, fences and gates may "make the garden seem closed off from the public." An

exploration of this hypothesis could be quite meaningful to community garden stakeholders looking for a concrete and manageable ways to make changes that could increase public support.

Possible Processes/Psychological Mechanisms

As the results of this study begin to reveal, there are many possible mediator variables in the relationship among physical features, expertise, and impression. It would interesting to explore the mechanisms that influence impression, which have been explored by Rachel and Stephen Kaplan (Kaplan & Kaplan, 1982) in other natural urban environments. And as was mentioned above, the level of familiarity could be explored as a rationale for community gardeners' differing impression responses.

Temporal Issues

Exploration of effects of temporal differences in community gardens would be a logical next step; as this is a landscape which can look very different over time. As was mentioned in the Literature Review of this thesis, community gardens are often seen as an eyesore during the winter months. An investigation into how seasonality might affect public support would be topical to community garden stakeholders. In addition to seasonality, it would be interesting to look at gardens in different stages in their growth, as trees become taller and other features appear more established.

Proximity to Greenspace

Past studies have looked at the effects of nearby nature on satisfaction with community (Kaplan & Austin, 2004) and as a buffer of the adverse effects of life stress among children (Wells & Evans, 2003). In the same vein, it would be interesting to explore how proximity to community gardens might influence impression and other dependent variables, such as health and wellbeing.

Specific physical feature categories

The results of this study should be taken as a first step towards a better understanding of how people see the community garden, and the variety of features that are unique to its landscape. A logical next step would be to delve further into the effect of physical features on impression. For instance, this study only included low to high levels of specific features, but it would be interesting to compare levels of features to total absence of features. Additionally, because there is such great diversity among features, it makes sense to look at variation in typology across features. For example, researchers could look at effects of different tree species (i.e. pines versus London plane trees), different species of other natural features (flowers versus vegetables, and even more specific), different types of built features (casitas versus gazebos), and so on.

CONCLUSION

Not long ago, the community gardening movement faced seemingly insurmountable obstacles, especially those presented by various levels of government. With symbolic efforts such as Michelle Obama's Kitchen Garden

on the White House lawn, “the link between gardening and healthy lifestyles” (USDA Office of Communications, 2010, para. 5) is becoming increasingly visible to the public eye. More and more people are beginning to see the community garden as an invaluable addition to the urban landscape. While these changes in governmental and public sentiment provide strong foundational support; it is critical to be conscious of the fact that this is just the beginning. Continued efforts to find common ground in community gardens must be carefully planned and well-informed if they are to survive the test of time.

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